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SECONDARY SCHOOL TEACHING

By

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University of Texas .

NEW EDITION



GINN AND COMPANY

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PREFACE

IN TIMES of national emergency and in the peace that follows, the two-fold task of education is to consolidate cultural positions and to conserve and strengthen vital resources for future advances toward human freedom and understanding. If this task is to be achieved in a democratic society, all operations must be motivated by an unswerving faith in the ultimate goodness of human nature. To waver in this belief is to admit that the democratic way is doomed to failure, because that way of life is founded upon man's humanity to man and upon his willingness to lose self for the common good. Since man is potentially good, each individual has worth, however high or low his estate may be. Here resides the undying principle of modern education. All forces and activities of that education drive forward with an unyielding belief in the worth of the individual.

The wisdom of this belief carries certain unalterable conclusions. The dicta of formalism must yield to the release of creative powers, that the learner may live abundantly and that others may profit from his living. Hokum and pedantry in verbalism must cease, and words must be restored to their primary purpose of conveying meaning. The safe retreat into bookishness must be scorned, and realities must be faced with resolute courage. True, the principles of life and living that man has learned must not be discarded, but they must be relearned through vigorous contact with democratic culture. Words born as sound symbols in the past must be utilized, but first they must be reset in associations that carry precise and realistic meanings to the young learner of the present. The true knowledge carried in books must not be abandoned, but it must be sifted by the learner — not worshiped — and used to serve him in the problems he faces today. These fundamental truths of the educative process burn with renewed intensity as an uncertain future lies ahead. Yet they have an illustrious ancestry. Where they were born no man can say, but they were nourished in the minds of Comenius, Rousseau, and Froebel; kept alive by thousands of intelligent followers; and fostered in more recent times by Mann, Parker, and Dewey. They are the beacons that inspire and guide the modern teacher.

Since the turn of the century the light of these principles has revealed

many new ways to implement the time-honored ideals of great teachers. The newer practices do more than provide the techniques that make learning natural; they strike deep into the sources of human behavior and clarify much that formerly was discerned only through the insight and intuition of the truly great.

The volume in hand seeks to integrate for the prospective teacher still in college and for the teacher in service the best theory and practice of the recent developments with the best of the practices long used by superior teachers. Written from a background of nine years of supervisory and administrative experience and fifteen years of college and university teaching of education, the book seeks to blend the theoretical and the practical in an effective manner. Careful attention has been given in the revision to promising movements that began to mature in the late thirties and early forties. If the aim of the work has been successfully consummated, this book should be of considerable value to prospective secondary-school teachers and to teachers already in the junior and senior high school and in the junior college.

The union of the proved practices of the past with the equally effective though different and more stimulating features of the new education has necessitated a reorientation of the field of method. The reorientation has been achieved in this volume by building the system around three principles, the reciprocal relations of which, since the turn of the century, have gradually centered in a widely accepted philosophy certain to be of great influence in secondary education during the next score of years. Concentrated in one sentence, the three principles hold that the secondary school from Grades Seven through Fourteen should *guide the individual pupil through wide, complete, unified experience* to give him the ability to face confidently and to meet successfully the problems of contemporary life. Thus the three principles stress *guidance* as a vital part of teaching, emphasize *individualized instruction*, and accept the *unit idea*.

The first chapter uses the findings of research in outlining for the student the main problems he will face as a teacher. In doing so it demonstrates the initial step of the unit idea. The reader, himself the learner, in Chapter I experiences the initial step of the unit process by becoming *aware* of his own problem in broad outline, and at the outset should thereby appreciate the significance subsequently of having his pupils *first* see and define each problem "in the large" as they launch their *attack* toward its solution. The new edition supplements the old by stressing the need for a *varied* preparation in both liberal and conservative prac-

tices, since the prospective teacher cannot know what the philosophy of his first school may be.

His goal broadly defined in terms of activities, traits, attitudes, and ideals, the student is led into the problems which every prospective teacher should understand before attempting to teach. These are the "pre-instructional problems" presented in Division I. The purposes toward which he is to guide the adolescent are clarified in Chapter II. They have been extended to include those that arose during the national emergency. In Chapter III the guidance viewpoint in teaching is discussed, and the techniques by the use of which information about pupils may be collected are described. Great progress has been made in the problem of pupil adjustment. The old view of discipline through punishment has vanished, and the new view of the development of self-control and self-reliance through success in interesting and worth-while endeavor has succeeded it. Marked advance was made toward these viewpoints during the late thirties and early forties. The basic principles of pupil adjustment and the techniques derived from them are presented in Chapter IV. The sources from which motives and drives arise and the techniques for stimulating and directing them are treated in Chapter V as the final problem in the pre-instructional group. The guidance viewpoint runs as a theme through the entire division.

Division II is devoted to the unit concept. In Chapter VI its origin and development are traced from Herbart through his successors to the present day. Nine applications of the concept are analyzed in detail to give the student a clear view of recent educational innovations. The underlying principles of the ninth application, the workbook, continue to be sound, though their uses have varied in recent years as teacher-pupil participation in the development of plans and learning materials has tended to replace the printed workbook. The principles may now be applied to the co-operative enterprise. Chapter IX sets forth a four-stage unit plan derived from earlier plans and from the experience of the writer. It provides for the guidance of the individual pupil or the group through wide, unified learning experiences. As the reader proceeds through the division, he will realize that many of the study and work techniques involved in each of the plans, particularly those of the final integrated plan, may be used by teachers who do not follow the unit idea in its entirety. They may be added as enrichments to any mode of instruction.

The third division of the volume deals with additional classroom practices, both the long-established and the recently developed. Chapters X

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SECONDARY SCHOOL TEACHING

INTRODUCTION

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CHAPTER I • Becoming Aware of the Teacher's Problems

GENERAL VIEW OF THE CHAPTER

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Problems Reported by Beginning Teachers

Activities of Teachers

Topics of Greatest Value to Teachers

Traits of Teachers

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Purpose of the Chapter

A GOOD rule to follow in any learning situation is to gain an overview at the outset. The reader is a learner about to begin a study of teaching in secondary schools. This chapter provides him with the opportunity to gain an overview of teaching before beginning the attack upon its numerous aspects. In this case, as in any other learning situation, the experience of viewing the general picture serves a double purpose. It provides an outline for a well-organized study of the field, and it sets forth some of the main features.

Learning proceeds most rapidly when the learner senses its significance. In fact, it may be doubted that real learning ever occurs unless the would-be learner is convinced that it will carry him toward some worthwhile purpose or goal. At the moment the reader's purpose is to become a successful secondary-school teacher. That purpose will be held in mind most effectively if he will constantly picture himself teaching a class of high-school boys and girls. That picture in the imagination will enable the reader constantly to relate his purpose to his study of teaching, and thus it will provide a wholesome stimulus to master in advance the many and varied abilities that classroom teaching involves. In order to make the picture vivid and realistic, the reader may wish to visit a high-school class before proceeding far with his study. If this is not immediately possible, he may in the meantime recall his own high-school class and visualize it engaged in activities within the field of his major interest.

The more real the picture, the more keenly will the reader appreciate the significance of the problems discussed in this book, and, consequently, the more rapidly will he advance toward his goal.

The abilities and characteristics needed by the successful teacher are indicated in the remainder of this chapter to give the overview that makes for well-organized learning. The details are carried in the chapters that follow. Those chapters will aid the reader in defining and outlining numerous problems, will present the best-known evidence regarding the solution of the problems, will recommend the best solutions, so far as the evidence will permit, and will thereby offer the reader the opportunity to acquire a large number of attitudes, ideals, insights, and skills essential to meeting successfully the classroom situation he is soon to face as a teacher.

Problems Reported by Beginning Teachers

For a number of years the writer received reports from beginning teachers on the problems they encountered during the first year of teaching. In Table 1 are reported those which caused greatest difficulty. The individual items are there ranked according to difficulty.

Special attention is called to two types of problems recorded in Table 1: those related to inadequate command of methods and those arising from inadequate command of subject matter. Approximately the same proportion of the beginning teachers reported each of the two types of difficulties, the latter type being mentioned largely by those who had been required to teach subjects in which they had inadequate college preparation. The prospective teacher should understand clearly that these two general problems are interrelated. One must be a master of the subject matter beyond the level he expects to teach, and in addition he must be a master of the methods by which it can best be taught, if he is to attain his maximum success in teaching.

About a fifth of the group reported difficulty in adapting subject matter to the level of their secondary-school pupils. It is unfortunate but true that many a brilliant and successful college student does not distinguish himself in secondary-school teaching because he is unable to tone down to the level of his students. He understands what he tells them and thinks that they do, but they do not. He is shooting over their heads. It is highly important at this point that he consciously modify his language so that his class can understand. Lectures from his college notebook will not fit secondary-school pupils.

TABLE 1. PROBLEMS REPORTED BY 157 BEGINNING TEACHERS

Rank Order	Special ¹		Academic		Total	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
1. Discipline	18	51	61	50	79	50
2. Motivation	5	14	30	25	35	22
3. Inadequate command of methods . . .	6	17	29	24	35	22
4. Planning the instruction	8	22	26	21	34	22
5. Insufficient equipment	7	19	26	21	33	21
6. Assignment	3	8	28	23	31	20
7. Inadequate command of subject matter .	5	14	24	20	29	18
8. Adapting subject matter to pupils' level	3	8	24	20	27	17
9. Budgeting one's time	7	17	18	15	25	16
10. Relations with pupils	3	8	21	17	24	15
11. Classroom management	6	17	11	9	17	11
12. Adjustment to local community	3	8	12	10	15	10
13. Marking	1	3	12	10	13	9
14. Staff relationships	8	22	4	3	12	8
15. Too heavy teaching load	4	11	7	6	11	7
16. School routine outside of classroom . .	4	11	4	3	8	5
17. Social relations outside of school . . .	0	0	7	6	7	4
18. Providing for individual differences . .	0	0	4	3	4	3
19. Too large classes	1	3	3	2	4	3
20. Combating aversion to new types of teaching	0	0	4	3	4	3
Number of teachers responding	35	22	122	78	157	100

Adjustment to the local community is a problem of great significance to the young teacher who is entering a community different from the one in which he has lived. This affects not only his relations outside the classroom but those within as well. If he does not show respect for the customs of the community, it will be difficult for him to gain the loyalty of his pupils. Without the loyalty and confidence of his class he will be seriously handicapped, however well he may have mastered both subject matter and methods of teaching.

Certain problems reported were the results of retrenchment programs; for example, "Too heavy teaching load" and "Too large classes." Since the beginning teacher cannot prevent these and similar conditions, he should anticipate them and accept them without surprise or shock. Few beginning teachers are fortunate enough to find ideal teaching situations.

Of considerable significance to the prospective teacher is the variability of both the curricular offerings and the instructional practices among school systems. During the thirties and early forties there was a nation-

¹ Teachers of art, industrial education, music, and physical education.

wide attempt to remodel the secondary school to fit the needs of the **adolescent** in our American democracy. New learning materials were introduced — in the form of complete new subjects in some cases and as enrichments of existing subjects in other cases. Also many new procedures of instruction were devised to launch the new courses and to revitalize the old.

The movement for reorganization has taken the form of state-wide curriculum revision programs in most of the forty-eight states, but it has not progressed at the same rate in all. Furthermore, the method of the revision program in a given state has sought to be democratic rather than dictatorial; that is to say, the programs have solicited the co-operative effort of many teachers and school systems in determining the changes to be made, rather than preparing the new materials in a central state office and distributing them for all teachers to use. This essentially democratic plan has resulted in different rates of progress in school systems within a state.

This situation complicates the problem of the prospective teacher to a considerable degree. He must become prepared to fit any stage of progress and to march at any rate, because he cannot know long in advance of his employment in a given school system what the stage and rate of that system may be. He cannot assume that the school in which he does his student teaching is typical of the state or region in which he expects to teach. That school may be on the frontier of educational progress, it may be an average school in its advancement, or it may have made little (if any) progress in the last decade. Nor can the young teacher assume that the secondary school from which he graduated is at all representative of the schools of his region. That school, too, when he graduated, may have been extremely liberal, moderate, or extremely conservative in its educational theory and practice.

Several hints to the student who faces this situation are in order. In the first place, he might seek to develop for himself a rather clear picture of secondary schools at various stages of advancement, to learn the characteristics of each stage in terms of curriculum, student activities, instruction, library usage, guidance, objectives, and other aspects of secondary education. It would also be of interest to try to determine the status of the secondary schools from which he graduated and in which he does his student teaching. To visit other schools near his home or college with a view to studying their procedures would help one to understand the differences between schools within the region. All the while,

the prospective teacher should be conscious of the range — from ultra-liberal to ultraconservative — within which he will be expected to operate, and should strive to become prepared for any type of secondary-school program he might enter as teacher.

The beginning teachers who co-operated in the study reported above failed to see many of the problems which they were about to face. Study and observation of the types just suggested will reveal to the prospective teacher important details not included in the earlier report. Even so, just as a young physician, however well trained, does not have the insight of an experienced physician, the student or beginner will overlook aspects of the school or class situation which are commonplace to the mature teacher. Therefore, while much good will result from a study of problems reported by beginners or observed by the student himself, it is of importance to consider also the experiences of those older in the profession. A more comprehensive study, discussed in the following section, outlines the problems which every teacher should understand.

Activities of Teachers

One approach toward determining what prospective teachers should study and master is to prepare a list of all activities performed by teachers. Such a list would be a set of goals toward which the student in education should direct his energies. Mastery of the activities which he would be required to perform would be a logical procedure in his preparation for teaching. In following this procedure, however, one should realize that it alone is not adequate, because it ignores the personal traits of the teacher.

It is probably true that if two persons have the same traits of mind, character, and personality, the one who would perfect the most techniques associated with the activities of teaching would become the better teacher. But a mere technician, however skillful, could not become a superior teacher if he lacked the personal traits which give life to teaching. Consequently it is important that the prospective teacher understand clearly not only the activities which will be expected of him but also the personal traits which are considered essential to successful teaching.

The most comprehensive study which has attempted to list both the activities of teaching and the traits desirable in teachers was conducted by Charters and Waples. The list of activities assembled in this study

included a thousand and one different activities classified under the following seven main divisions:

- DIVISION I. Teachers' Activities Involved in Classroom Instruction. [122 activities]
- DIVISION II. Teachers' Activities Involved in School and Class Management. (Exclusive of Extra-curricular Activities) [384 activities]
- DIVISION III. Activities Involving Supervision of Pupils' Extra-classroom Activities. (Exclusive of Activities Involved in School and Classroom Management) [148 activities]
- DIVISION IV. Activities Involving Relationships with the Personnel of the School Staff. [227 activities]
- DIVISION V. Teachers' Activities Involving Relations with Members of School Community. [55 activities]
- DIVISION VI. Activities Concerned with Professional and Personal Advancement. [43 activities]
- DIVISION VII. Activities in Connection with School Plant and Supplies. [22 activities]¹

Since it is our purpose in this chapter only to gain an overview of the field of teaching, the student is referred to the report of the study for a detailed list of the thousand and one activities. The following outline indicates the method of reporting and presents some of the activities:

DIVISION I. Teachers' Activities Involved in Classroom Instruction

1. A. Planning:

- 2. Selecting activities to be planned:
- 3. Selecting objectives
- 4. Planning selection and organization of subject matter
- 5. Planning methods of developing interests
- 6. Planning methods of instruction
- 7. Planning methods of assigning work
- 8. Planning methods of providing sufficient opportunity for pupils' activities
- 9. Planning facilities for individual study
- 10. Planning methods of evaluating pupils' needs, abilities, and achievements
- 11. Planning methods of developing teachers' personal traits
- 12. Finding adequate time for planning
- 13. Finding efficient methods of planning (e.g., working out methods, obtaining methods from others)

¹ W. W. Charters and Douglas Waples, *The Commonwealth Teacher-Training Study*, pp. 257-303. The University of Chicago Press, 1929. Reprinted by permission of The University of Chicago Press.

14. Writing and recording plans (e.g., outlining plans, noting central points)
15. Evaluating and revising plans (e.g., correcting plans after use, adjusting plans to results of tests)
16. Filing and preserving plans
17. Utilizing plans (e.g., referring to plans while teaching)¹

Topics of Greatest Value to Teachers

If the prospective teacher could know which parts of the various courses in professional education had proved of greatest value to teachers, he would have an index to the topics upon which he should concentrate. The topics which teachers of experience report as the most valuable parts of their training would be an especially keen challenge to him because of their established usefulness.

Fortunately, an important study has been conducted in this field. Peik,² with the co-operation of teachers in the public schools, was able to evaluate the topics of various education courses on the basis of their worth to teachers. Of particular interest to the reader are those topics included in the general-methods courses. The following were reported as having been of greatest value:³

1. The function and the objectives of high school education which the teacher must keep in mind in the teaching process
2. The course of study — construction, evaluation, use, and modification
3. The recitation
 - A. Lesson planning
 - B. Assignment
 - C. Methods of teaching
 - a. The types of recitation
 - b. Modern methods of the recitation emphasized
 - aa. Problem method
 - bb. Project method
 - cc. Socialized recitation
 - dd. Study, supervised study
 - D. Principles of teaching
 - a. Motivation
 - b. Socialization

¹ Charters and Waples, op. cit. p. 257.

² W. E. Peik, *The Professional Education of High School Teachers*. The University of Minnesota Press, 1930.

³ Ibid. pp. 131-132.

TABLE 2. RANK-LIST OF TEACHERS' TRAITS¹

Traits	Rank for Teachers of	
	Grades X-XII Senior H. S.	Grades VII-IX Junior H. S.
1. Adaptability	8	10
2. Attractiveness, personal appearance	17	14
3. Breadth of interest (interest in community, interest in profession, interest in pupils)	1	10
4. Carefulness (accuracy, definiteness, thoroughness)	11	13
5. Considerateness (appreciativeness, courtesy, kindness, sympathy, tact, unselfishness)	17	3
6. Co-operation (helpfulness, loyalty)	11	9
7. Dependability (consistency)	14	19
8. Enthusiasm (alertness, animation, inspiration, spon- taneity)	9	4
9. Fluency	23	24
10. Forcefulness (courage, decisiveness, firmness, independ- ence, purposefulness)	5	4
11. Good judgment (discretion, foresight, insight, intelligence)	2	1
12. Health	16	16
13. Honesty	7	12
14. Industry (patience, perseverance)	19	8
15. Leadership (initiative, self-confidence)	4	7
16. Magnetism (approachability, cheerfulness, optimism, pleasantness, sense of humor, sociability, pleasing voice, wittiness)	11	4
17. Neatness (cleanliness)	20	16
18. Openmindedness	9	20
19. Originality (imaginativeness, resourcefulness)	22	22
20. Progressiveness (ambition)	23	23
21. Promptness (dispatch, punctuality)	21	14
22. Refinement (conventionality, good taste, modesty, moral- ity, simplicity)	14	20
23. Scholarship (intellectual curiosity)	5	16
24. Self-control (calmness, dignity, poise, reserve, sobriety)	2	2
25. Thrift	25	25

The student will readily recognize many of the twenty-five traits as having been characteristic of the high-school teachers whom he remembers as superior. Self-appraisal and self-development with respect to each trait would be a profitable as well as an interesting procedure for each student to follow, because superintendents of schools in seeking teachers invariably take into consideration a large number of the traits listed in Table 2.

¹ W. W. Charters and Douglas Waples, *The Commonwealth Teacher-Training Study*, p. 18. The University of Chicago Press, 1929. Reprinted by permission of The University of Chicago Press.

Professional Attitudes and Ideals

It is highly important that the student in education gain an overview of the activities and information which will be called into play when he obtains his first teaching position. It is likewise essential that he have a general understanding of the traits considered significant in the successful teacher's life. But over and above these techniques, knowledges, and characteristics hover certain modes of thought, mind-sets, attitudes, or ideals which have become somewhat standard for the profession of teaching. They determine what a teacher should do and what he should not do.

These determiners of action within the profession have taken shape in various codes of ethics for teachers. In 1896 the state teachers' association of Georgia adopted the first official state code for teachers, and by 1930 thirty-three states had taken similar action.¹ Students will find the codes for their respective states of particular interest. The code for any state is usually available at the office of the state education association. In 1929 the National Education Association officially approved the following code :

CODE OF ETHICS OF THE NATIONAL EDUCATION ASSOCIATION OF THE UNITED STATES

PREAMBLE

In order that the aims of education may be realized more fully, that the welfare of the teaching profession may be promoted, that teachers may know what is considered proper procedure, and may bring to their professional relations high standards of conduct, the National Education Association of the United States has developed this code of ethics.²

ARTICLE I. RELATIONS WITH PUPILS AND TO THE COMMUNITY

Section 1. The schoolroom is not the proper theatre for religious, political, or personal propaganda. The teacher should exercise his full rights as a citizen but he should avoid controversies which may tend to decrease his value as a teacher.

Section 2. The teacher should not permit his educational work to be used for partisan politics, personal gain, or selfish propaganda of any kind.

Section 3. In instructional, administrative, and other relations with pupils, the teacher should be impartial, just, and professional. The teacher should

¹ "Ethics in the Teaching Profession," *Research Bulletin of the National Education Association* (January, 1931), 9: 7-8.

² The term "teacher" as used in this code is intended to include every person directly engaged in educational work whether in a teaching, an administrative, or a supervisory capacity.

consider the different interests, aptitudes, abilities, and social environments of pupils.

Section 4. The professional relations of the teacher with the pupils demand the same scrupulous guarding of confidential and official information as is observed by members of other long-established professions.

Section 5. The teacher should seek to establish friendly and intelligent co-operation between home and the school.

Section 6. The teacher should not tutor pupils of his classes for pay.

ARTICLE II. RELATIONS TO THE PROFESSION

Section 1. Members of the teaching profession should dignify their calling in every way. The teacher should encourage the ablest to enter it, and discourage from entering those who are merely using the teaching profession as a stepping stone to some other vocation.

Section 2. The teacher should maintain his efficiency and teaching skill by study, and by contact with local, state, and national educational organizations.

Section 3. A teacher's own life should show that education does ennoble.

Section 4. While not limiting his services by reason of small salary, the teacher should insist upon a salary scale suitable to his place in society.

Section 5. The teacher should not exploit his school or himself by personally inspired press notices or advertisements, or by other unprofessional means, and should avoid innuendo and criticism particularly of successors or predecessors.

Section 6. The teacher should not apply for another position for the sole purpose of forcing an increase in salary in his present position. Correspondingly, school officials should not pursue a policy of refusing to give deserved salary increases to their employees until offers from other school systems have forced them to do so.

Section 7. The teacher should not act as an agent, or accept a commission, royalty, or other reward, for books or supplies in the selection or purchase of which he can influence or exercise the right of decision; nor should he accept a commission or other compensation for helping another teacher to secure a position.

ARTICLE III. RELATIONS TO MEMBERS OF THE PROFESSION

Section 1. A teacher should avoid unfavorable criticism of other teachers except such as is formally presented to a school official in the interests of the school. It is also unprofessional to fail to report to duly constituted authority any matters which involve the best interests of the school.

Section 2. A teacher should not interfere between another teacher and a pupil in matters such as discipline or marking.

Section 3. There should be cooperation between administrators and classroom teachers, founded upon sympathy for each other's point of view and recognition of the administrator's right to leadership and the teacher's right to

self-expression. Both teachers and administrators should observe professional courtesy by transacting official business with the properly designated person next in rank.

Section 4. The teacher should not apply for a specific position unless a vacancy exists. Unless the rules of the school otherwise prescribe, he should apply for a teaching position to the chief executive. He should not knowingly underbid a rival in order to secure a position; neither should he knowingly underbid a salary schedule.

Section 5. Qualifications should be the sole determining factor in appointment and promotion. School officials should encourage and carefully nurture the professional growth of worthy teachers by recommending promotion, either in their own school or in other schools. For school officials to fail to recommend a worthy teacher for another position because they do not desire to lose his services is unethical.

Section 6. Testimonials regarding a teacher should be frank, candid, and confidential.

Section 7. A contract, once signed, should be faithfully adhered to until it is dissolved by mutual consent. In case of emergency, the thoughtful consideration which business sanction demands should be given by both parties to the contract.

Section 8. Due notification should be given by school officials and teachers in case a change in position is to be made.¹

Overview of Problems Treated in This Volume

The foregoing discussion and findings of various research studies have given a general view of the major aspects of the teacher's work. Opportunity has been provided for one to become aware of specific problems which confront the student preparing to teach. In the following chapters this array of problems is systematized in a manner which will facilitate mastery of the field.

Division I includes problems fundamental to the successful use of any teaching procedure. The problem of the objectives or purposes of secondary education is treated first because the student should fully appreciate, at the outset of his study of teaching, the major tasks the teacher is expected to perform for society and for the individual pupil. After the student has gained a knowledge of the primary purposes of his future work he is introduced to the problem of relating the teacher's

¹ Sarah T. Muir (chairman), "Final Report of the Committee on Ethics of the Profession," *Addresses and Proceedings of the National Education Association*, pp. 179-182. National Education Association, 1929.

activities to the interests, needs, and capacities of the individual pupil, a central theme in modern education. The details of this problem lead to more general considerations of pupil adjustment and guidance. The study of the individual pupil likewise forms a basis for stimulating the individual and the group to wholesome activity. These associated problems of adjustment and motivation are presented in Chapters IV and V.

The second division presents the various plans of instruction that have been developed since the turn of the century to care for individual differences, and integrates their essential features into a workable composite which is applicable under any general scheme of school organization. The unit plan of instruction is the central idea of the division.

The traditional and modern techniques related to planning the learning activities and to presenting them to pupils in a stimulating manner and the problems of visual education are presented in Division III. These long-established practices, as well as the more recently invented techniques pertaining to them, are essential to successful teaching under any plans of instruction. Recent developments in education resulting from the invention of the radio, the principles and practices of scientific measurement in education, and the problem of recording and reporting pupil progress are also treated in the third division of the volume.

The teacher's work is not limited to classroom instruction. Recent years have added much to his extra-instructional load. To win that confidence of his pupils which adds weight to his words, and to learn of the environment of his pupils, he must give proper consideration to community life. To gain the respect and friendship of his associates in the faculty, which make for cordiality and a high esprit de corps, he must be aware of his staff obligations. And finally, to grow in the profession, he must participate in professional organizations and understand the methods of self-analysis and improvement. Information related to these important activities of the teacher is presented in Division IV.

In so far as it is possible to do so, the steps in the learning process mentioned in the first paragraph of this chapter are used in each succeeding chapter. The main problem of the chapter is analyzed into its significant parts as a means of defining it clearly; information relevant to the problem is presented and discussed; whenever possible, evidence from reliable investigations is drawn in support of the various solutions of the problem; and opportunities may be offered the student, at the discretion of the instructor, to observe or to apply accepted theory in classroom situations, thereby making it a part of his equipment for teaching.

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DIVISION I

Pre-instructional Problems



CHAPTER II · Secondary School Teaching and the Objectives of Secondary Education

CHAPTER III · Knowing the Individual Pupil and Facilitating His Development in the Secondary School

CHAPTER IV · Pupil Adjustment in the Secondary School

CHAPTER V · Stimulating Secondary School Pupils to Wholesome Activity



CHAPTER II · Secondary School Teaching and the Objectives of Secondary Education

GENERAL VIEW OF THE CHAPTER

The Value of Purpose in Teaching

Applying the Five Steps of Problem-solving to the Problem of Objectives

Early Aims of Education

PLATO (427-348 B.C.), all-round development
ARISTOTLE (384-322 B.C.), a virtuous life in a virtuous state
COMENIUS (1592-1670), knowledge, morality, piety
ROUSSEAU (1712-1778), unfoldment of inborn powers
PESTALOZZI (1746-1827), development of the forces of intelligence
HERBART (1776-1841), moral development
FROEBEL (1782-1852), learning to do by doing
SPENCER (1820-1903), complete living

Recent Aims of Education in General

JOHN DEWEY (1859-), culture, social efficiency, vocational independence
BOYD H. BODE (1873-), continual intellectual and spiritual growth
ROSS L. FINNEY (1875-1934), the telic function of education
EDWARD L. THORNDIKE (1874-), the fullest satisfaction of human wants

Recent Aims of Secondary Education

ALEXANDER INGLIS (1879-1924) presented three aims and six functions
SAMUEL CHESTER PARKER (1880-1924) divided the ends of secondary education into three "ultimate purposes" and five "proximate purposes"
THE COMMISSION ON THE REORGANIZATION OF SECONDARY EDUCATION (1918) set forth the "seven cardinal principles of secondary education"
HARL R. DOUGLASS (1892-) offered four general outcomes of high-school teaching in relation to methods
L. V. KOOS (1881-) presented four aims and six functions
THOMAS H. BRIGGS (1877-) presented ten aims of secondary education

The Educational Policies Commission recommended four classes of objectives of education in American democracy.

The war made the democratic way of life the chief objective.

Aims and Purposes of Secondary Education

Changing Social Conditions and the Progression of Method

Ten Social-Economic Goals

Education as Guidance

Selected References for Further Study

The Value of Purpose in Teaching

IN A true sense the teacher is a guide who is directing the journey of those whom he teaches. If they are to make progress in the right direction, certainly the guide should hold the destination clearly in mind. The objectives of general and secondary education have been carefully defined. A thorough understanding of those purposes is of primary importance if the teacher is to be an effective guide.

A teacher's failure fully to appreciate the aims of education and his consequent inability to give purpose to pupils' activities result in a situation similar to that in which Alice and the Cheshire cat found themselves just before she visited the mad tea party.¹

"Will you tell me, please, which way I ought to go from here?"

"That depends a good deal on where you want to get to," said the Cat.

"I don't much care where —," said Alice.

"Then it doesn't matter which way you go," said the Cat.

"— so long as I get *somewhere*," Alice added as an explanation.

"Oh, you're sure to do that," said the Cat, "if you only walk long enough."

Knowing the aims, the teacher introduces the students to those experiences which will enable them to attain the goals set for them by the broad objectives of education in a democratic civilization.

Another value of purpose is its tendency to focus attention on the desired outcome, thereby eliminating waste motion. The teacher who keeps his purpose in mind does not permit himself to become lost in a maze of meaningless activities. He knows what he is about and drives straight to the mark without needless waste of energy and time.

Furthermore, knowledge of aim generates motive power. Enthusiasm grows with clarity of purpose. Just as the teacher motivates his students by encouraging them to set forth their purposes, so will the teacher himself, at the outset and continually throughout his teaching career, increase his power by fixing firmly and definitely in mind those things which he wishes his teaching to achieve. First comes purpose; then follow the activities which will attain the purpose. From the growth which attainment brings arise new purposes.

The sum total of the objectives of education constitutes the philosophy of education which gives one a viewpoint and general attitude of mind toward all his teaching activities. At any time he is able to check his

¹ Lewis Carroll, *Alice in Wonderland*, p. 55. E. P. Dutton & Co., Inc., 1929.

course against his ultimate purposes, in much the same manner as a navigator uses a star to guide his voyage.

In any aspect of life clear-cut purposes give direction to one's activities, conserve his energies by preventing needless activity, and give drive to his actions. In teaching, an understanding of objectives guides the teacher, facilitates progress, and lends zeal to his efforts.

Applying the Five Steps of Problem-solving to the Problem of Objectives

All but one of the five steps of problem-solving presented in Chapter VI, page 144, can be applied to the problem of making the objectives of secondary education a part of one's equipment for teaching. From the foregoing has come an awareness of the significance of the problem. The remainder of the chapter defines the problem in terms of past and present aims of education, considers in more detail widely accepted purposes of secondary education, and presents suggestions for applying the problem to secondary-school teaching. The one step which cannot be applied to the problem, that of verification, must await the development of tests to measure those outcomes of education broader than acquisition of subject matter, the chief outcome for which satisfactory tests are now widely available.

As the sixth step, that of making the objectives a permanent part of his teaching equipment, the student will have the opportunity for practice in relating the objectives to the secondary-school subjects that he expects to teach.

Early Aims of Education

The following sketches of the educational views of leading thinkers of the past give an overview of the main philosophies which have guided practice since Greece was in its supremacy. It is obviously not intended here that the student gain a full understanding of these philosophies. To do that he may consult the translated original sources and the secondary sources listed at the end of the chapter. The brief introduction afforded at this point, however, should lend perspective to one's conception of the purpose of education. It is suggested that the student, as he reads, make a list of the central ideas in the aims proposed by various writers and indicate the number of times each of the central ideas is stressed. This

procedure will suggest the relative importance of the aims and simultaneously will aid the student in formulating a set of aims which will eventually direct his own teaching procedures. Furthermore, it will enable him to keep his bearings as he studies the several statements of aims.

PLATO (427-348 B.C.)

Plato would have education give to the body and to the soul all the beauty and all the perfection of which they are capable. Toward this all-round development for the child from the age of seven to seventeen the study of gymnastics and music is suggested, with such other subjects as reading, writing, arithmetic, and geometry to be introduced not as compulsory subjects but as occasional activities to meet the interests of the child. From seventeen to twenty should come military training. Those capable of further intellectual pursuit should study the sciences from twenty to thirty, and those of highest ability should continue for another five years. The state should control education, and both sexes should be trained to the limit of their abilities for their places in society.

Social justice was to be attained through dividing society continually into three classes according to demonstrated ability in learning: the highest class was the philosopher, who should rule; next lower was the soldier, who should protect all under the guidance of the philosopher; and finally came the artisans, who should obey and support the other two classes.

ARISTOTLE (384-322 B.C.)

The greatest good for mankind could come best through an education which would enable each individual to live a virtuous life in a virtuous state, according to Aristotle.¹ The "greatest good" emphasized the importance of practice as well as theory, of well-doing as well as well-being: arguments and theories alone might make those people good who were "naturally noble," but they "are incapable of converting the mass of men to goodness and beauty of character." For many, therefore, the formation of good habits should precede instruction in theory.

Virtue as the aim of education was a practical aim. It would enable the individual to gain the highest degree of happiness. It implied "making them [citizens] good and able to do fine actions," and therefore involved not only one's treatment of himself but his duties to others as well.

¹ Aristotle, *Politics* (translated by Benjamin Jowett), Vol. II, Part I, Chapter XVII in Book VII to end of Book VIII. Oxford University Press, 1885.

COMENIUS (1592-1670)

Johann Amos Comenius, a religious and educational leader, stressed knowledge, morality, and piety as the outcomes of education.¹ Education should begin in infancy and should be given in the school of "the mother's lap." All children, rich and poor, should attend the "vernacular school" from six to twelve. The "Latin school" should cover the period from twelve to eighteen, and a university should be provided for youth from eighteen to twenty-four.

Although a religious leader, Comenius did not look upon education only as a means of salvation; but as Cubberley states, "... he believed in the education of human beings simply because they were human beings."²

Knowledge comes through three channels, the senses, the intellect, and divine revelation, according to the teachings of Comenius. Proper balance between the three sources would lead to the higher aims of morality and piety, and bring one to the highest goal of life.

His method of teaching was very practical. All subject matter should be carefully graded and arranged to follow the "order of nature," and the child's understanding should be approached through sense perception.

ROUSSEAU (1712-1778)

In the first sentence of his chief work on education Rousseau,³ the French critic of organized society, sets forth the fundamental principle upon which his theory of education is based, "Everything is good as it comes from the hand of the author of nature; but everything degenerates in the hands of man." The main purpose of education, then, is the unfoldment of the inborn capacities of every human being. Subject matter should be made available only as it is needed to aid in this process. Education should come from nature, from man, from things, to meet the needs of the unfolding being. Of the three, nature is the greatest source.

The chief purpose of training before the age of five years is to keep the impulses and instincts free from vice and to give physical development. The childhood training from five to twelve should be full of experiences that develop the senses: "All that enters the human under-

¹ Johann Amos Comenius, *The Great Didactic* (translated by M. W. Keatinge). A. & C. Black, Ltd., 1907.

² Ellwood P. Cubberley, *The History of Education*, p. 410. Houghton Mifflin Company, 1920.

³ Jean Jacques Rousseau, *Émile* (translated by William H. Payne). D. Appleton-Century Company, Inc., 1906.

standing comes through the sense." "Our first teachers of philosophy are our feet, our hands, and our eyes." "At the age of twelve, *Émile* will hardly know what a book is." Until reading is useful to him, any attempt to teach him reading "serves only to annoy him."

Moral training is to come through "natural consequences." Rational knowledge through the natural sciences should be given in answer to the child's natural curiosity during the "interval (12-15) when his faculties and powers are greater than his desires." To make *Émile* economically independent, he is given industrial experience. His moral and social traits are to be developed between fifteen and twenty by coming in contact with his fellow men, not by studying books.

PESTALOZZI (1746-1827)

Following Rousseau, Pestalozzi held that education should follow the natural growth of the child.¹ Education is "the natural, progressive, and harmonious development of all the powers and capacities of the human being." Through mental and moral development of each child, rich and poor, Pestalozzi hoped to rid each person of his degradation and thereby reform society. While Rousseau's *Émile* was a child of the wealthy, Pestalozzi's first pupils were twenty of the most needy children he could find, whom he took into his home and taught.

Pestalozzi systematized or "psychologized" instruction to harmonize with the natural and orderly development of the child's instincts, capacities, and powers. Education he considered a process. Lacking funds for supplies and equipment, he developed his own devices and methods. So successful were his procedures that progressive teachers flocked to his institute at Yverdon.

HERBART (1776-1841)

"The term 'virtue' expresses the whole purpose of education,"² wrote Herbart, the German philosopher. The virtue or moral character of Herbart included "inner freedom" or harmony between volition and desire, and such traits as benevolence or good will, justice, and equity. To attain this goal, education must supply the mind with presentations to "complete the circle of thought." His procedure involved five

¹ Johann Heinrich Pestalozzi, *How Gertrude Teaches Her Children* (translated by Lucy E. Holland and Frances C. Turner). C. W. Bardeen, 1898.

² From Johann Friedrich Herbart, *Outlines of Educational Doctrine* (translated by Alexis F. Lange), Chapters I-II. 1901. By permission of The Macmillan Company, publishers.

distinct steps, which are discussed somewhat fully in Division II of this volume.

According to Herbart the will is not independent but must be shaped by education; hence education becomes the chief basis of conduct. This development of the will or formation of character is, according to Herbart, the chief function of education.

FROEBEL (1782-1852)

Both Herbart and Froebel were greatly influenced by Pestalozzi. The latter worked with Pestalozzi at Yverdon for two years. Froebel¹ set forth the practices later followed at Keilhau in his Universal German Institute of Education. The fundamental principles in this school were self-expression, free development, and social participation. Spontaneous self-activity was considered the best method of development, and the impulses and instincts were regarded as natural forces to be trusted. The self-activity and creativeness of more recent schools of thought may be found in the theory and practice of Froebel. Although his work was largely limited to the kindergarten, his theory of learning by doing should find a place at all levels.

SPENCER (1820-1903)

Herbert Spencer maintained that subject matter should be selected on the basis of its contribution toward "complete living."² He approached the problem scientifically by analyzing the activities of life into five categories:

1. Those activities which directly minister to self-preservation.
2. Those activities which by securing the necessities of life indirectly minister to self-preservation.
3. Those activities which have for their end the rearing and discipline of offspring.
4. Those activities which are involved in the maintenance of proper social and political relations.
5. Those activities which make up the leisure part of life, devoted to the gratification of the tastes and feelings.

It then became the purpose of education, in Spencer's view, to prepare for complete living by using that knowledge of "most worth." Spencer

¹ Friedrich Froebel, *The Education of Man* (translated by W. N. Hailmann). D. Appleton-Century Company, Inc., 1905.

² Herbert Spencer, *Education: Intellectual, Moral, and Physical*, pp. 1-87. D. Appleton and Company, 1860.

considered the sciences, social as well as physical, to be of greatest value in preparing for complete living and maintained that they should be given a prominent place in the curriculum.

Recent Aims of Education in General

Spencer's scientific analysis of education may be said to have ushered in the twentieth-century viewpoint. There is much of the old in the new, a fact which should add weight to the more recent enunciation of aims and give the student confidence as he clarifies his thinking and formulates his own philosophy of teaching.

DEWEY (1859-)

John Dewey, generally accepted as the greatest modern educational philosopher, defines education as

that reconstruction or reorganization of experience which adds to the meaning of experience, and which increases ability to direct the course of subsequent experience.¹

To him, as to Froebel and other earlier writers, education is a process. It is development, and its general aim is social efficiency. Learning by doing is stressed throughout his philosophy: "The school cannot be a preparation for social life except as it reproduces the typical conditions of social life." "The school should be life, not a preparation for living."

Dewey emphasizes industrial competency as an aspect of social efficiency, since a person unable to earn his own living is a burden to others. Social efficiency likewise covers good citizenship and the ability to make life richer to oneself and others by participating in worth-while social experiences.

BODE (1873-)

Boyd H. Bode prefaces his statement of the aim of education by saying that in any aspect of life "Aims spring from the soil of experience, and new aims constantly arise as experience develops."² Since education is "a process of growth," "a liberation of capacity," it is not desirable to restrict it to one all-inclusive aim. To do that would turn the growth too

¹ From John Dewey, *Democracy and Education*, pp. 89-90. 1916. By permission of The Macmillan Company, publishers.

² From Boyd H. Bode, *Fundamentals of Education*, p. 6. 1921. By permission of The Macmillan Company, publishers.

much in one direction instead of permitting a many-sided growth. "Life is more than vocation, more than knowledge, more than citizenship." To foster "intellectual and spiritual growth," perhaps the best aim, if education must have an all-inclusive aim, "is to provide as adequately as possible for the creation of new aims." One's present activities in all aspects of life are steppingstones to a "continuously enlarged and transformed" life. It is the purpose of education to facilitate this continuously growing process.

FINNEY (1875-1934)

If society is to progress on a rational basis, the educational program should anticipate what the social order of the future "ought to be" and "help create" it.¹ Finney calls this broadly social purpose of education the "telic function of education." "Usually the learning process of today has been inadvertently predetermined by the social process of yesterday; but it can be deliberately predetermined, in part at least, by the conscious will of educational statesmen."

Finney deplores the fact that the social studies receive small recognition in the curriculum. Drawing from the history of the Jews, the Greeks, and the Romans illustrations of disaster following refusal to heed the man who keeps his "finger on the pulse of the Zeitgeist and his eye on the dial of history," he urges educators to apply the teachings of social scientists and to "make education telic."

THORNDIKE (1874-)

Thorndike analyzes educational aims and gives samples "of the millions of aims that we have actually before us in the concrete work of education."² Elsewhere, with Gates, the "chief aim of education" is stated as follows: "to realize the fullest satisfaction of human wants."³ "In general, education aims to diminish or abolish those cravings which are futile or antagonistic to the satisfaction of other wants and to cultivate those wants which do not reduce or which actually increase the satisfaction of others." Since human wants or cravings are the main source in "initiating and sustaining action of all kinds," they should be

¹ From Ross L. Finney, *A Sociological Philosophy of Education*, pp. 118-131. 1929. By permission of The Macmillan Company, publishers.

² From Edward L. Thorndike, *Education*, Chapters II-III. 1912. By permission of The Macmillan Company, publishers.

³ From Edward L. Thorndike and Arthur I. Gates, *Elementary Principles of Education*, p. 20. 1929. By permission of The Macmillan Company, publishers.

the "central concern of the process of education." Since happiness is dependent upon the satisfaction of wants, "'the greatest happiness for the most people' is substantially equivalent to our statement of the aim of education in terms of satisfying human wants." Thus by starting at the seat of action in human nature, according to the educational psychologist, education is more certain to reach desired objectives.

Recent Aims of Secondary Education

The educational aims of recent writers presented above have been aims of education in general. The following deal with secondary education and will be presented in greater detail.

INGLIS (1879-1924)

Alexander Inglis has been called the father of secondary education in America. He was the first to analyze thoroughly our system of secondary education and to set up its aims and "functions." His *Principles of Secondary Education* is one of the American educational classics.¹

Inglis stated "the three fundamental aims of secondary education" as follows:

1. The preparation of the individual as a prospective citizen and cooperating member of society — the Social-Civic Aim;
2. The preparation of the individual as a prospective worker and producer — the Economic-Vocational Aim;
3. The preparation of the individual for those activities which, while primarily involving individual action, the utilization of leisure, and the development of personality, are of great importance to society — the Individualistic-Vocational Aim.

The social-civic aim, "obviously most important in a democracy," includes the appropriate "ideals, standards, and habits" related to conduct; co-operation in social activities; community, state, and national life; and political principles. These should be developed through participation "in the activities of the school itself and the community," and "throughout all [there should be] the development of a social conscience or sense of social responsibility."

Preparation for economic-vocational life involves knowledge of economics and the economic world, "discovery and development of special

¹ Alexander Inglis, *Principles of Secondary Education*, p. 368. Houghton Mifflin Company, 1918.

interests and aptitudes," vocational information and guidance, "a conception of the relations between fellow-members of a vocation" and "some knowledge of industrial-governmental relations."

The individualistic-avocational aim deals primarily with the "leisure part of life," including the fine arts, literature, physical recreation, "the development of interests, hobbies, etc."

The six functions outlined by Inglis are the adjustive or adaptive, the integrating, the differentiating, the propaedeutic, the selective, and the diagnostic or directive. A function, in the sense used by Inglis, is a means or process by which the aims are to be attained. Thus the secondary school should provide means to enable the pupil to adjust himself to his social environment; should give those common experiences which tend to make people like-minded, to integrate them socially; should provide for the various abilities and capacities, thereby differentiating according to native aptitude; should give those preparing for college the training required for college entrance; should sort the students according to ability to assume leadership in society; and should determine what each student can best do and direct his activities toward those ends. These requirements, in turn, parallel the six functions proposed by Inglis.

PARKER (1880-1924)

According to Samuel Chester Parker the three ultimate aims of high-school instruction are *social efficiency*, — economic, domestic, and civic, — *good will*, and *harmless enjoyment*, while the more detailed aims, the "proximate purposes," are health, information, habits, ideals, interests.¹ Parker defined social efficiency as the ability to do things effectively in social situations, "to control and handle affairs, to get results, to achieve and accomplish." Social efficiency "must be directed by good will, or the endeavor to work for the common good." To provide for proper use of leisure, education must give consideration to training in modes of harmless enjoyment.

The "proximate" purposes are the steppingstones to the ultimate purposes. The health of the pupils should be a greater concern of the schools than it has been in the past, and the teacher should serve as "a source of suggestions for activities that contribute to health." Information, because its acquisition is relatively easily measured, has been "often emphasized in subjects where it should be considered relatively unim-

¹ Samuel Chester Parker, *Methods of Teaching in High Schools*, p. 16. Ginn and Company, 1920.

portant." While information is important, it should not be overstressed at the sacrifice of habits, interests, and ideals. Desirable general and special habits, both motor and mental, should be fixed. Numerous opportunities should be afforded for the application of "such ideals as service, honesty, and thoroughness," and "it is important to see that students actually take advantage of the opportunities." Abiding interest, as a purpose of education, "owes its prominence historically to the German educational reformer, Herbart." "The most important proximate aim of instruction is to determine and fix in the character of the pupil the lines of interest which will occupy him in later life."

COMMISSION ON THE REORGANIZATION OF SECONDARY EDUCATION

The Seven Cardinal "Principles" of Secondary Education

The category of aims of secondary education most widely accepted is the one announced by the Commission on the Reorganization of Secondary Education.¹ The seven objectives set forth by that body are health, command of fundamental processes, worthy home membership, vocation, citizenship, worthy use of leisure, and ethical character. The objectives are defined as follows:

1. *Health.* Health needs cannot be neglected during the period of secondary education without serious danger to the individual and race. The secondary school should therefore provide health instruction, inculcate health habits, organize an effective program of physical activities, regard health needs in planning work and play, and cooperate with home and community in safeguarding and promoting health interests. . . .

2. *Command of fundamental processes.* Much of the energy of the elementary school is properly devoted to teaching certain fundamental processes, such as reading, writing, arithmetical computations, and the elements of oral and written expression. The facility that a child of 12 or 14 may acquire in the use of these tools is not sufficient for the needs of modern life. . . . Proficiency in many of these processes may be increased more effectively by their application to new material than by the formal reviews commonly employed in grades seven and eight. . . .

3. *Worthy home membership.* Worthy home membership as an objective calls for the development of those qualities that make the individual a worthy member of a family, both contributing to and deriving benefit from that membership.

¹"Cardinal Principles of Secondary Education," *United States Bureau of Education Bulletin No. 35*, 1918, pp. 5-10. United States Department of the Interior. Government Printing Office, 1918.

This objective applies to both boys and girls. The social studies should deal with the home as a fundamental social institution and clarify its relation to the wider interests outside. Literature should interpret and idealize the human elements that go to make the home. Music and art should result in more beautiful homes and in greater joy therein. . . .

In the education of every high school girl, the household arts should have a prominent place because of their importance to the girl herself and to others whose welfare will be directly in her keeping. . . .

In the education of boys, some opportunity should be found to give them a basis for the intelligent appreciation of the value of the well-appointed home and of the labor and skill required to maintain such a home, to the end that they may cooperate more effectively. . . .

4. *Vocation.* Vocational education should equip the individual to secure a livelihood for himself and those dependent on him, to serve society well through his vocation, to maintain the right relationships toward his fellow workers and society, and, as far as possible, to find in that vocation his own best development.

This ideal demands that the pupil explore his own capacities and aptitudes, and make a survey of the world's work, to the end that he may select his vocation wisely. . . .

5. *Civic education* should develop in the individual those qualities whereby he will act well his part as a member of neighborhood, town or city, State, and Nation, and give him a basis for understanding international problems.

For such citizenship the following are essential: a many-sided interest in the welfare of the communities to which one belongs; loyalty to ideals of civic righteousness; practical knowledge of social agencies and institutions; good judgment as to means and methods that will promote one social end without defeating others; and as putting all these into effect, habits of cordial cooperation in social undertakings. . . .

6. *Worthy use of leisure.* Education should equip the individual to secure from his leisure the recreation of body, mind, and spirit, and the enrichment and enlargement of his personality.

This objective calls for the ability to utilize the common means of enjoyment, such as music, art, literature, drama, and social intercourse, together with the fostering in each individual of one or more special vocational interests. . . .

7. *Ethical character.* In a democratic society ethical character becomes paramount among the objectives of the secondary school. Among the means for developing ethical character may be mentioned the wise selection of content and methods of instruction in all subjects of study, the social contacts of pupils with one another and with their teachers, the opportunities afforded by the organization and administration of the school for the development on the part of pupils of the sense of personal responsibility and initiative, and, above all, the spirit of service and the principles of true democracy which should permeate the entire school — principal, teachers, and pupils. . . .

DOUGLASS (1892-)

Harl R. Douglass¹ approached the problem of aims somewhat differently by listing the general outcomes of teaching and discussing the type of method best productive of each desired outcome. The outcomes of instruction treated in this manner by Douglass are the acquisition and imparting of information, the retention of information once acquired, and the acquisition of habits, skills, ideals, and attitudes. Although it is almost inevitable that any given classroom activity will contribute to more than one of the desired outcomes, Douglass makes it clear that in any classroom situation one aim will be dominant and that the types of treatment may be differentiated to satisfy the needs of the given situation.

Whatever the outcome, the teacher should understand the methods by which it can best be attained. This view of the problem forms a valuable corollary to the various statements of aim.

KOOS (1881-)

For the compilation of the aims and functions of secondary education Leonard V. Koos² drew upon printed addresses, articles in periodicals, and other written sources containing viewpoints on the purposes of secondary education. These writings yielded a total of twenty-one aims and functions which were summarized by Koos as follows:

Aims

1. *Civic-social-moral responsibility.*
2. *Recreational and aesthetic participation and appreciation.*
3. *Occupational efficiency* (inclusive of preparation for higher institutions for those planning to continue their education).
4. *Physical efficiency.*

Functions

5. *Achieving a democratic secondary education.*
6. *Recognizing individual differences.*
7. *Providing for exploration and guidance.*
8. *Recognizing the adolescent nature of pupils.*
9. *Imparting knowledge and skills in fundamental processes.*
10. *Fostering transfer of training* (with guarded acceptance).

¹ Harl R. Douglass, *Modern Methods in High School Teaching*, p. 2. Houghton Mifflin Company, 1926.

² Leonard V. Koos, *The American Secondary School*, pp. 153, 167. Ginn and Company, 1927.

BRIGGS (1877-)

Writing for the Seventh Yearbook of the Department of Superintendence, Thomas H. Briggs¹ elaborated upon the ten aims of secondary schools:

1. *Integration*, to aid other institutions in the formation of an integrated citizenry.

2. *Satisfaction of Needs, both the immediate and future*. "All values that are sought should be clearly perceived and approved by the students."

3. *Revelation of the Racial Heritage*. This includes the development of an appreciation for and of a desire to receive the culture of the past as well as a knowledge of that culture.

4. *Exploration of Pupils' Interests, Aptitudes, and Capacities*. This aim would seek to avoid the "tragic evidence of failure when after years of study the 'educated' individual does not know for what he is fit."

5. *Systematization and Application of Knowledge*. Emphasis should be placed upon scientific laws and principles and their application to give the student an intelligent understanding of their influence on his life.

6. *Establishment and Direction of Interests*. "Culture may be best measured by the number, variety, and depth of interests," not only in the traditional fields of human knowledge and art but also in other activities which carry value for the individual and give promise of becoming abiding interests.

7. *Guidance*. After having learned through exploratory courses and tests of various kinds the abilities and capacities of the pupil, the secondary school "should aid each student as wisely as possible to decide what he will do with his life."

8. *Differentiation*. Specialization along lines of individual interests should be slight in the earlier years of secondary school and increase slowly as the pupil continues to "not more than three fifths of the curriculum at the end of the usual secondary period."

9. *Methods of Teaching and Learning*. Independent thinking should supersede, in part, the methods of the elementary school and the beginnings of research should be introduced. These methods demand more of teachers than drill methods "but the results are greater."

10. *Retention and Direction of Pupils*. The secondary school should retain pupils as long as it is of profit to them and to society for them to remain in school. This involves the development of curricula which will be of value for pupils of varying abilities and the direction of them into work in which they can be successful.

¹Thomas H. Briggs, "The Special Functions of Secondary Schools," Seventh Yearbook of the Department of Superintendence of the National Education Association (1929), Part I, pp. 196-207. Subsequently in his *Secondary Education*, Chapters XIII and XIV. The Macmillan Company, 1934.

SECONDARY SCHOOL TEACHING

EDUCATIONAL POLICIES COMMISSION

A statement of objectives that carries much weight, both because it followed a critical analysis of the democratic process and because it was set forth by a group of distinguished educators, is that published by the Educational Policies Commission in 1938.¹ In the judgment of this body, the objectives of education may be identified under four general classifications²:

1. The Objectives of Self-Realization
2. The Objectives of Human Relationship
3. The Objectives of Economic Efficiency
4. The Objectives of Civic Responsibility

An analysis is made of each of the four classifications in terms of the traits and abilities essential for the educated person, producer and citizen in our democracy:

THE OBJECTIVES OF SELF-REALIZATION³

The Inquiring Mind. The educated person has an appetite for learning.

Speech. The educated person can speak the mother tongue clearly.

Reading. The educated person reads the mother tongue efficiently.

Writing. The educated person writes the mother tongue effectively.

Number. The educated person solves his problems of counting and calculating.

Sight and Hearing. The educated person is skilled in listening and observing.

Health Knowledge. The educated person understands the basic facts concerning health and disease.

Health Habits. The educated person protects his own health and that of his dependents.

Public Health. The educated person works to improve the health of the community.

Recreation. The educated person is participant and spectator in many sports and other pastimes.

Intellectual Interests. The educated person has mental resources for the use of leisure.

Aesthetic Interests. The educated person appreciates beauty.

Character. The educated person gives responsible direction to his own life.

¹ *The Purposes of Education in American Democracy.* Educational Policies Commission, National Education Association and American Association of School Administrators, Washington, D.C., 1938.

² *Ibid.* p. 47.

³ *Ibid.* p. 50.

THE OBJECTIVES OF HUMAN RELATIONSHIP ¹

Respect for Humanity. The educated person puts human relationships first.

Friendships. The educated person enjoys a rich, sincere, and varied social life.

Co-operation. The educated person can work and play with others.

Courtesy. The educated person observes the amenities of social behavior.

Appreciation of the Home. The educated person appreciates the family as a social institution.

Conservation of the Home. The educated person conserves family ideals.

Homemaking. The educated person is skilled in homemaking.

Democracy in the Home. The educated person maintains democratic family relationships.

THE OBJECTIVES OF ECONOMIC EFFICIENCY ²

Work. The educated producer knows the satisfaction of good workmanship.

Occupational Information. The educated producer understands the requirements and opportunities for various jobs.

Occupational Choice. The educated producer has *selected* his occupation.

Occupational Efficiency. The educated producer succeeds in his chosen vocation.

Occupational Appreciation. The educated producer appreciates the social value of his work.

Personal Economics. The educated consumer plans the economics of his own life.

Consumer Judgment. The educated consumer develops standards for guiding his expenditures.

Efficiency in Buying. The educated consumer is an informed and skillful buyer.

Consumer Protection. The educated consumer takes appropriate measures to safeguard his interests.

THE OBJECTIVES OF CIVIC RESPONSIBILITY ³

Social Justice. The educated citizen is sensitive to the disparities of human circumstances.

Social Activity. The educated citizen acts to correct unsatisfactory conditions.

Social Understanding. The educated citizen seeks to understand social structures and social processes.

Critical Judgment. The educated citizen has defenses against propaganda.

Tolerance. The educated citizen respects honest differences of opinion.

Conservation. The educated citizen has a regard for the nation's resources.

Social Applications of Science. The educated citizen measures scientific advance by its contribution to the general welfare.

World Citizenship. The educated citizen is a co-operating member of the world community.

¹ Ibid. p. 72.

² Ibid. p. 90.

³ Ibid. p. 108.

Law Observance. The educated citizen respects the law.

Economic Literacy. The educated citizen is economically literate.

Political Citizenship. The educated citizen accepts his civic duties.

Devotion to Democracy. The educated citizen acts upon an unswerving loyalty to democratic ideals.

The Democratic Way of Life

Since the invasion of Manchuria by Japan in 1931, the dictator nations of Asia and Europe have threatened the democratic way of life on all continents. During the late thirties and early forties democracy after democracy fell before the blitzkriegs of Hitler, and each that did not fall began to count the days before its turn would come.

The reaction of the educational leaders in the United States is revealed in the recommendations of the Educational Policies Commission, particularly in the objectives of civic responsibility quoted above. Numerous other groups and individual writers have contributed scores of books and hundreds of articles that seek to define American democracy and to sensitize the nation to its internal and external dangers in time of war. In attempting to unify the nation in a solid front, writers have traced the fundamental principles of democracy to their sources and have set them forth as objectives for education. Thus Charles Beard,¹ in 1939, wrote:

When we concentrate our thought upon experience in the United States, we find six enduring elements now intertwined under the prevalent conception of democracy: popular government within a span of time, efficiency in function, sustaining economy, civil liberty, appropriate education, and the spirit of humanity and enlightenment which lifts men and women above the beasts of the field and confers upon them moral rights and social duties. These six elements are inseparable parts of the whole. Neglect or failure of one imperils the fortunes of all.

In another publication of the Educational Policies Commission,² some of the conditions necessary to gain the full benefits of the democratic way are stated:

A. Freedom of thought, speech, and action.

B. The right to share in government.

C. The right to a full development of individual talents.

¹ Quoted from the *Journal of the National Education Association*, October, 1929, in *Current Documents on Democracy* (p. 7), Educational Policies Commission, National Education Association and American Association of School Administrators, Washington, D.C., February, 1941.

² *Our Democracy*, p. 10. (Contains extensive bibliography and lists of films and radio recordings.)

- D. The duty to respect the common will.
- E. A government with authority to enforce the people's will.
- F. Tolerance and mutual respect among groups.
- G. Acceptance of personal responsibility.

In his address before Congress, January 6, 1941, President Roosevelt defined the four essential human freedoms sought by the democratic nations:

The first is freedom of speech and expression — everywhere in the world.

The second is the freedom of every person to worship God in his own way — everywhere in the world.

The third is freedom from want — which, translated into world terms, means economic understandings which will secure to every nation a healthy peacetime life for its inhabitants — everywhere in the world.

The fourth is freedom from fear — which, translated into world terms, means a worldwide reduction in armaments to such a point and in such a thorough fashion that no nation will be in position to commit an act of physical aggression against any neighbor — anywhere in the world.

Freedom means the supremacy of human rights everywhere.

It should be clear to the reader that in recent years the fundamentals of democracy set forth in these and numerous other statements have become dominant aims of secondary education. Few have claimed that the ideals of democracy have been attained in our way of life. All have urged that our schools be the agency for the perpetuation and improvement of our culture, and there has been unanimity of opinion that this service is the best contribution the schools can make toward moral defense against the totalitarian threat.

An even more tangible objective emerged after the state of national emergency had been proclaimed, that of physical preparation. Overnight the schools of the nation accepted the new objective and placed their physical resources at the disposal of the duly constituted authorities. Technical high schools began operating twenty-four hours a day, training men for the machine industries; leaders in home economics and agriculture began revising their programs to forestall food shortage; teachers of social studies began revitalizing their offerings and procedures¹; and other departments used their resources wherever they could be of value. After the declaration of war, such activities were greatly intensified.

¹ J. W. Baldwin, *A Survey of the Present Status and Current Trends in the Social Studies Curriculum in Texas Schools*, University of Texas Publication No. 4132. The University of Texas, Austin, August 22, 1941.

The method of strengthening our physical powers was direct and objective. Not so with the problem of strengthening our moral forces through use of the fundamentals of democracy. An issue of considerable importance to teachers both for the present and the future is involved in the question of how best to guarantee that the fundamental principles of democratic living will become potent influences in directing the lives of youth and adults.

Some educators favor indoctrination and point to the success of Hitler with the youth of Germany as evidence of the effectiveness of this method. No American educator would condone the more extreme techniques of indoctrination of the German ministers of education and propaganda, that ignored truth when it stood in their way, used falsehood brazenly whenever it would serve their purposes, and forbade the use of any evidence contrary to the views of the leader. Yet some sincerely believe that in times of stress, particularly, it is legitimate as well as expeditious to sacrifice to some degree the critical faculties of the learner and to cause him to accept without complete thoughtful reaction those principles of democratic life considered fundamental in our society. While they would reject indoctrination in its ultimate degrees of imposition, some educators thus would not be averse to imposing their views upon children and youth. Those who oppose this view are also sincere in their faith in the democratic way of life and in the principles that sustain it.

The latter group maintains that indoctrination and democracy are antithetical terms; that indoctrination, even in its milder forms of imposition, prostitutes the most cherished virtue in democratic life — freedom of thought, the inherent right of the individual in a democracy to exert his own powers of mind in making his decisions. As opposed to telling children and youth what to think, they consider it safer and surer to permit them to learn how to think. They believe the foundation of democratic living will be strongest when children and youth accept the principles of democracy of their own volition after deliberative study of and personal experience with those principles in the democratic processes of everyday life. They believe that faith in democracy will not be sound or sincere unless gained through choice, that faith imposed by indoctrination would be an unsafe foundation for future democracy.

The most immature person is able to recall instances in which he became enthusiastic about some enterprise in which he had a voice and to which he gave unstinted effort. He will also recall other enterprises in which his interest was lukewarm because he was denied the opportunity

to help chart the course or sail the ship. For example, in one school the participation of students in the management of the school is successful because the students are given the opportunity to help with planning and to assume the responsibility of executing the plans; whereas, in another school, student participation is a complete failure because it is a rubber-stamp for the principal. So it is in all phases of democratic living. The child and youth must be given a stake in the enterprise. They must feel a part of it if their faith in it is to become deep-seated and sincere. They will never feel a part of the great enterprise of democracy if approached through the autocratic method of indoctrination.

The safer methods reside in schools that have become veritable workshops of democracy by the use of three general procedures: A study of the precepts or principles through which democracy operates; the exemplification of democratic human relations in all aspects of school life; and the participation of pupils and teachers in democratic processes. Some schools have not learned to apply all three procedures. For example, one school uses only precept and feels that its task is performed; but in such schools the human relations within its walls may refute every precept it seeks to teach by use of words alone. At the other extreme, another school uses only participation and considers itself very democratic and patriotic; but its pupils may find themselves in a whirlpool of activity with no consciousness of direction or purpose. The sanest approach is to use all three procedures. Principles of democracy must be studied. They must be compared with the precepts of the other ways of life if our minds are to remain free. They must be understood, not just accepted in mental blindness. And that understanding must be progressive as the child and youth develop toward maturity. Example must accompany the precept. The superintendent and principal must be democratic in their relations with the teachers, and the teachers must be democratic in their dealings with pupils, if the school processes are to exemplify democracy in action. And it is of still greater importance that exercise through participation accompany both the precept and the example. Thus the school that is to be in reality a workshop of democracy must use all of the three great tools of democratic education: precept, example, and participation.

The prospective teacher should not passively accept the viewpoint that is implied in the foregoing discussion; nor should he accept without mental reaction the viewpoints he will find in the references listed at the end of this chapter. Instead he should follow the democratic way by considering all viewpoints and arriving at his own conclusions.

The several categories of aims and objectives of secondary education outlined above will present, upon one's first reading, a somewhat confused picture, particularly if that reading has been somewhat hurried and not accompanied by an attempt to select the main ideas and check their recurrence. This should not disturb the student. Even after careful rereading and deliberation the student may find it difficult to appreciate the full meaning of the several major aims. Clarification will gradually result from further deliberation and from the student's attempt to set up his own statement. It is hoped that the following discussion of aims will assist the student in understanding the task which our American society has set for its secondary schools.

Aims and Purposes of Secondary Education

In any civilized society the purposes of its education are to aid the *individual* in developing his abilities and to preserve and improve the *society*. Thus the general purposes of education may be classified as the *personal* objectives and the *social* objectives. In a society which subjects the individual to the social group the educational system becomes a most potent instrument for achieving the aims of the group regardless of the cost to the individual. In the end the individual exists entirely for the social group. Italy under the Fascists and Germany under the Nazis illustrate this type of social group. The abilities of the individual are developed; that is to say, some of the personal purposes of education are achieved, but only that the social purposes may be more effectively consummated.

In a society in which the social group has been formed in order that the individual may have greater freedom in his pursuit of happiness the purposes of education are still twofold: personal and social. The personal purposes enable the individual to develop all his potentialities, so that he may enjoy as enriched and abundant a life as his capacities will permit. The social purposes seek to develop in him those attitudes and habits which make living together possible and which clear the way for his personal happiness. The group is only an organization to facilitate the better living of the individual. It is upon this ideal that the American democracy was built and toward which it continues to strive.

In our American democracy, then, the public schools, from kindergarten through university, exist for the preservation and *improvement* of that democracy, to the end that the life of the individual may be increas-

ingly richer and more abundant. Under such a plan what are the personal aims of education and what are the social aims, particularly during the secondary stage? Relationships spread from the personal aims to the social, and others from the social to the personal, entwining the two sets of purposes into an almost inseparable whole, but they are developed here in two categories for the sake of clarity and emphasis.

The Personal Purposes of Secondary Education

By personal purposes are meant the knowledge, habits, skills, attitudes, interests, ideals, and standards that apply primarily to the individual and to his own living and only secondarily affect the group in which he lives. The attainment of any one of the personal objectives requires the development of numerous abilities, either physical or mental or both, which will enable the person to realize a full life. It is the task of secondary education to provide the activities, experiences, knowledge, and skills which will facilitate the development of those abilities. It is the teacher's part to guide and otherwise aid the pupil as he engages in the activities. There are seven major personal objectives toward which the secondary-school teacher and pupil should direct their efforts. They are as follows :

1. *Physical health.* Physical health is a basic requirement for successful living. At times this objective has been lost sight of in the pursuit of intellectual activities; but when the World War draft revealed that approximately one third of the men in America were physically unfit for military service the nation awakened to the need for a better balance between the physical and the mental in our schools. Now an observer may find rapidly developing physical programs in most states, and in addition he will note a changed attitude toward the relative importance of physical and mental development. Teachers everywhere consider themselves guardians of their pupils' physical health. Less emphasis is placed upon perfect attendance records and more thought given to keeping well. Pupils are (or should be) permitted to do only as much work as they can without injury to their health. Hospital ideals of cleanliness are entering our schools, and teachers are recognizing that it is their responsibility to detect the symptoms of common diseases. Every secondary-school teacher, regardless of his field of specialization, should be conscious of his obligation to protect the physical health of his pupils.

2. *Mental health.* A healthy mind, like a healthy body, is essential to good living. One cannot get much from life if his mind is strained and twisted with fears, delusions, doubts, conflicts, worries, feelings of in-

security, or a sense of failure and a consequent lack of confidence. Nor can a life be full and rich if the mind is poisoned with suspicion, distrust, bitterness, hatred, or envy. Consequently the secondary school must prevent or combat these and other distracting mental and emotional tendencies. It must provide the environment and activities essential to normal, wholesome mental and emotional development. The prospective teacher should consider the attainment of sound mental health as one of the school's most important responsibilities. This problem is treated at some length in Chapters III and IV.

3. *Fundamentals of learning.* The basic skills in computation and in oral and written expression, the facts about the physical and biological sciences which enable the student to interpret his natural environment, information about society which helps him to adjust himself to the group, basic insights into music, drama, graphic arts, and the dance, — these are some of the important fundamentals of learning in which the secondary school should give adequate mastery. Maximum personal growth cannot be attained without them. They not only help one to live, they also help one to learn more about life; each requires learning for mastery, and once mastered each becomes a tool for further learning and understanding.

To the foregoing should be added at least one other fundamental of learning, one which is becoming increasingly important in modern life. It is the scientific method of problem-solving. It includes the abilities to sense a problem clearly, to analyze it thoroughly, to collect reliable information relevant to its solution, to apply and to check the solution, and to withhold one's judgment until the best possible solution has been applied to the problem and the results verified. Much practice in the use of this method should be given in the secondary school. Each pupil should master it to the limits set by his mental and emotional characteristics. If it becomes his habitual approach to his problems while in secondary school, it is likely to remain with him as a valuable tool long after the unused facts of subject matter have been forgotten. It should become a part of his mental equipment for life.

4. *Development of special interests and abilities.* The activities related to the mastery of fundamentals will reveal many special interests and abilities among pupils. Others will be discovered by such procedures as those described in Chapter III. Frequently one's life receives its fullest expression through one's special interests, such as dramatization, study of plant or animal life, collections of various sorts, constructing scientific instruments, or other hobbies of adolescence, or through his special abilities, such as music, art, physical education, or creative writing. Very often such interests or abilities become lifelong hobbies which are valuable supplements to one's main way of life. Consequently one of the im-

portant purposes of secondary education should be to discover and to facilitate the development of special interests and abilities. The teacher should look upon them as opportunities for the personal development of his pupils and should systematically encourage their formation.

5. *Vocational efficiency.* For the four fifths or three fourths of the students who will not go to college the secondary school should supplement the mastery of fundamentals with experiences which look more definitely toward earning a livelihood. It should be noted in passing, however, that the fundamentals already discussed are a highly important part of the training for any vocation.

Several factors which should govern the kind and amount of vocational training are the pupil's need for the training, the pupil's probable success in the vocation, the opportunities for employment, the kind of training recommended by prospective employers, and the per capita cost. Within these practical limits the secondary schools should offer specific vocational work, for certainly the ability to support oneself and one's dependents is a prime requisite to independent and otherwise good living.

6. *Wholesome recreation.* Secondary education should do much to develop the ability to enjoy wholesome recreation. This purpose becomes increasingly important as new machines are built to perform more and more of the work formerly done by hand. With an increasing amount of free time, in the absence of wholesome pastimes a person either will become a victim of boredom, which Machiavelli classified as the worst of fates, or he will escape ennui through practices which degrade. The secondary school must prevent both these undesirable alternatives by supplying wholesome experiences which will develop into lifelong diversions.

7. *A sense of values.* Almost every experience in life involves a choice of some kind. If a person does not have a fairly well-developed set of standards to guide him in his recreation, for example, he is lost in a confusing array of equally alluring possibilities and will soon become a prey to the highly commercialized era. He will need standards by which to judge the screen, the stage, the graphic arts, literature, and music. Whether a spectator or a participant, he will receive enjoyment from sports and other games in proportion to his knowledge of their standards of performance and sportsmanship. His personal life will be enriched by a code of high standards which regulates his associations with others. His serenity, if sustained by sound beliefs, will be secure even in an era of political discord and economic upheaval; he will not be enticed by the demagogue or disturbed by the crazed iconoclast, though he will give full consideration to whatever truth they speak.

It is too much to expect that the secondary school develop the pupil's sense of values to the stage of a well-ripened philosophy of life, but much can be done toward that ultimate end. The chief method should be

performance, not indoctrination; through practice the adolescent will learn the value of what the race approves; he will not be forced to follow dogma blindly. To afford that practice is a major purpose of secondary education and a major obligation of the secondary-school teacher. One may have developed a strong body and all his talents and have kept his mind normal; he may have learned many important facts, including how to earn a living and how to play; but if in the process he has not acquired a sense of values, he will be lost in a labyrinth of uncertainties. A true sense of values in life is the one indispensable personal objective of secondary education. Viewed from the standpoint of the individual, this one objective gives meaning and direction to the others.

Social Purposes of Secondary Education

It is agreed that in a democratic nation the group exists for the welfare of the individual. That his own welfare may be ensured, if not for additional and entirely altruistic reasons, the individual must abide by certain rules and acquire certain habits designed to facilitate his living with others. Secondary education should seek to develop a willingness and an ability to abide by the rules of the group. It should likewise stimulate the acquisition of the attitudes, the habits, and the social skills essential to the well-being of the group. These desirable outcomes may be called the social purposes of secondary education. They are good citizenship, social efficiency, and a progressive social outlook.

1. *Good citizenship.* Democratic government arises from the consent of the governed, not from decree or even from legislation. A willingness to obey law is fundamental to its successful execution. It is therefore highly important that the secondary school develop an appreciation of the need for rules and regulations and a willingness to obey those approved by the majority of one's group. Inasmuch as such understanding and willingness can come only from actual experience in activities and responsibilities of government, it becomes the task of the secondary school to provide those experiences. If our democratic society is to exist, the secondary school must in this manner develop citizens willing and eager to carry it forward.

2. *Social efficiency.* In its wider sense social efficiency includes good citizenship, but the phrase is used here to mean the ability to get along well with people. Even in this narrower sense social efficiency includes a large number of abilities and traits all of which should be specific objectives of secondary education. Some of the more important of the components of social efficiency are good will, social intelligence, tact, courtesy, co-operativeness, adaptability, desirable ethical standards, and a sense of fair play.

Good will, or habitual friendly feeling toward others, is fundamental in social efficiency. It guarantees sincerity. Social intelligence is the informational foundation for good taste. It includes knowledge of how all classes live, an appreciation of their mores, and the ability to practice their customs and amenities. At the secondary level perhaps all that can be expected is that the pupil master these abilities as they apply to his own social group.

Tact, courtesy, co-operativeness, and adaptability arise from good will and social intelligence. They are some of the important traits which make for harmony in social contacts. They oil the machine and prevent friction and heat. Every American classroom daily offers opportunities for their development, and every secondary-school teacher should consider their mastery as important as the mastery of principles of science, algebraic formulas, linguistic habits, or historical facts. They are important parts of the secondary-school subject matter. Their mastery will make the individual an efficient unit of his social group.

The discussion of the personal purposes of secondary education included, under a sense of values, a code of high standards which regulates one's associations with others, because such a code enriches one's personal life. It is obvious that desirable ethical standards also comprise a social purpose of secondary education. They make for social efficiency in a double sense by enabling the individual to get along well with others and by providing certain accepted rules by which the group may operate efficiently. A sense of fair play may be considered as an ethical standard or as a sort of umpire to oversee the application of such standards. In any event its importance in modern life justifies separate mention of it as a component of social efficiency. It should become generalized over as wide an area of adolescent experience as possible. By constant practice the sense of fair play should be developed into such a dominant attitude that the fair response will invariably be present to contribute to the efficiency of group action.

3. *A progressive social outlook.* Good citizenship and social efficiency imply more than the ability and willingness to do one's part efficiently under current conditions. They imply also a keen alertness to sense weaknesses in the social group and an active desire to make the improvements demanded by normal social evolution. Some social lag is highly desirable. Social changes should be applied only as rapidly as they can be absorbed without shock, like a drink to a thirsty man. But too much social lag is bad for the physical health of the organization and worse for its mental health. It ties up consumption and circulation, and it frustrates normal expression and expansion. The best tonic is a wholesome and progressive social outlook.

Such an outlook should be an objective of secondary education. It is

society's best preventive against stagnation, on the one hand, and revolutionary disintegration, on the other. It is the sound course to be pursued in a growing civilization and as such should be given emphasis in the secondary school. By achieving these social objectives the secondary school becomes the chief instrument for the preservation and improvement of our democratic society.

It would be difficult to overestimate the importance of the secondary school as a means for the attainment of the personal and social purposes discussed in the preceding paragraphs. Within the school the classroom teacher is the person who carries the major responsibilities for the fulfillment of these aims. Consequently the prospective teacher should gain a full appreciation of their significance. The purposes are summarized here for the student's convenience in reflective study :

Personal Purposes of Secondary Education

1. Physical health
2. Mental health
3. Fundamentals of learning
4. Development of special interests and abilities
5. Vocational efficiency
6. Wholesome recreation
7. A sense of values

Social Purposes of Secondary Education

1. Good citizenship
2. Social efficiency : good will, social intelligence, tact, courtesy, co-operativeness, adaptability, desirable ethical standards, and a sense of fair play
3. A progressive social outlook

The prospective teacher should also be well aware of the fact that one of the best ways to lead others to these desirable objectives is first to attain them in full measure himself and then by example to demonstrate to his students their meaning and value to both the individual and society.

Changing Social Conditions and the Progression of Method

It is equally important for the teacher to stimulate in his pupils an alertness to new social needs and to keep himself alert to the desirable changes in his own work which are made possible by new mechanical and social inventions. If he does not take advantage of these opportunities for worth-while improvements, there will be a tendency for the school to lag too far behind social progress. It therefore becomes the responsibility of the educator to sense or, better still, to anticipate the changes in society and to adapt both method and content to those changes.

A few illustrations will make this point clear. The motion picture, for example, should have had, and in many schools has had, a rather marked influence upon method. In addition to giving the teacher a new instructional device the motion picture has so affected the recreational program of the nation that the teacher must modify his teaching to prepare the pupil to receive the greatest good from the invention. Television will soon afford a more striking illustration. The thousands of vacation trips made possible by the automobile have added the richness of personal experience to geography and to social-study discussions in the classrooms. Urbanization of population during the machine era congested the schools and demanded changes in method to fit crowded classes. Increased wealth, popularization of education, and compulsory-attendance laws placed in the classroom larger percentages of children of high-school age, emphasizing the need for differentiation of method according to ability. Changes in family life called for closer guidance as an aspect of classroom method. Progress in medicine has emphasized the need for preventing the spread of contagious disease and has given the teacher the knowledge to do this effectively as he teaches. Discoveries in human nature have shown the need for better mental hygiene in the classroom and suggested techniques for making method more effective. New knowledge in the physical and biological sciences has offered new opportunities for enrichment of classroom instruction and for adjusting the pupil's living to the findings of scientists. The radio has brought the voice of genius into the most obscure school.

Civilization is still advancing. Every change should be reflected in the classroom. The teacher of tomorrow should catch the vision of change, and as he enters his lifework should be alert constantly to the opportunities which a changing social and economic order offer him progressively to alter his work to fit the successive steps of a growing civilization.

Ten Social-Economic Goals

In the fall of 1932 the National Education Association appointed a committee "to propose to the Association desired Social-Economic Goals of America," and "indicate the materials and methods which the schools of the nation should use to attain these goals." The committee was composed of the foremost educational philosopher of today, an eminent sociologist, a professor of law, and three leading American educators. Their statement of ten social-economic goals of America is therefore an

authoritative statement and suggests the direction toward which, in their opinion, American civilization should move during the next several decades.

In the words of the committee: "Social and economic policies and practices must be judged by what they do to enrich the lives of individuals. Therefore the desirable social-economic goals of America are stated in terms of the things we covet in the highest degree for the largest possible number of Americans."¹ The ten goals are *hereditary strength, physical security, participation in an evolving culture, an active flexible personality, suitable occupation, economic security, mental security, equality of opportunity, freedom, and fair play*. In defining the ten goals the committee continues :

"The development of rich personalities depends first of all upon the innate strengths and capacities of the individuals." Therefore the present tendency for the hereditary strength of the average individual to decrease as birth rate varies widely among our various social groups should be checked and measures "instituted in such wise as to increase constantly the percentage of our people who are 'wellborn.'"

In order to participate "in an evolving culture" every individual must possess those "Skills, technics, and knowledges that will enable him . . . to use and enjoy the culture of the group." He must also possess those "Values, standards, and outlooks," derived from racial experience and revised in the light of new social needs, which will "regulate the attention of the individual, determine his choices, organize his activities, and shape his personality."

The factors of "An active, flexible personality" include "Personal initiative," "Discriminating judgment and choice," "Flexibility of thought and conduct," and "Cooperativeness."

A suitable occupation is "a first requisite of a rich personality." This goal may be achieved through guidance, which will enable the individual to choose the vocation for which he is best fitted; suitable training; and placement in a position in which there is opportunity for advancement. Economic and mental security, closely related to a suitable occupation, should be brought about by reforms in our social and economic structure.

"Equality of opportunity, the birthright of every American, should involve for each individual the opportunity to live a healthy, happy, satisfying life, to have a comfortable, sanitary home, to have useful employment . . . to be surrounded by . . . beauty and truth . . . to enjoy the same rights under the law as are enjoyed by those more powerful or more favored by fortune, and to have the benefits of . . . educational facilities and other means of proper development. . ."

¹ "What Are Desirable Social-Economic Goals for America?" *Journal of the National Education Association* (January, 1934), 23: 6-12.

How to secure freedom for the individual "when social living is necessarily surrounding each of us with a network of prohibitions which the welfare of our neighbors imposes on us, is a very real problem." Yet this freedom is essential to self-expression which in turn "is the source of our keenest satisfactions." Therefore, it must be secured.

The tenth goal, fair play or justice, should be the prevailing attitude of mind under which the other nine objectives may be achieved. "Fair play with one's family is common, . . . with one's close neighbors . . . rather easy," but as "the circle widens" to include "the great impersonal 'public,' the tax upon our sense of fair play grows heavier." It is this general attitude of fair play which must be held if the other goals are to be reached.

Education as Guidance

It is not possible to predict at this time whether or not these ten goals set forth by the distinguished committee of the National Education Association will be attained by our society. The chances are rather great that definite progress will be made toward several of the goals within the near future. Whatever the future may bring, however, the role of the teacher, as stated earlier in this chapter, will continue to be that of a guide, leading those whom he teaches toward the objectives of education. If one were to classify all the normal, wholesome activities of youth, the main headings would indicate the types of guidance secondary-school teachers should be able to give. A partial list of activities would include (1) those related to games and sports and those related to hobbies and fads, both of which might be classified as recreational; (2) those involving choice of courses of study for secondary school and, later, for college, and those involved in progress through the subjects of study, which would be the educational; (3) those which relate to earning one's way or to the selection of one's lifework, the vocational; (4) those involving association with friends in and out of school, the social; (5) those in which problems of right or wrong might arise, the ethical or moral; (6) those related to one's responsibilities as citizen of school and community, the civic; (7) those which strive toward refinement of one's character, the cultural; (8) those related to bodily development and well-being, the physical and hygienic.

It is not intended that each teacher shall be able to guide pupils in all types of activities, but every teacher should be alert to a pupil's needs in all types, so that he can either give proper guidance himself or refer the pupil to someone else. Experience and study will widen the range within which the teacher himself can give the guidance.

Until the pupil has need of guidance, the teacher should not intrude. Unwanted suggestions are as annoying to the pupil of spirit as they are to the checker player. No teacher should be a "kibitzer." The thrill of achievement is missed if someone else has suggested how the thing might be done. Furthermore, the pupil could never develop initiative, self-reliance, and independence if the teacher persisted, by excessive guidance, in living the pupil's life for him.

Yet somewhere between no guidance and too much guidance is the golden mean. It lies close to the point where the pupil needs aid and realizes that he needs it, where he would profit more from receiving it than he would from not receiving it. To locate that point is not the least difficult part of teaching. It requires understanding of the individual pupil — his personal characteristics, his ability or lack of ability at the activity, the point of his progress in the activity, and his present state of mind. The overenthusiastic teacher will spoil the pupil's fun with unwanted advice; the wise teacher will either inhibit his impulse to intrude or will tactfully point to the way out of the difficulty.

Many educators maintain that the traditional subjects of the secondary-school curriculum do not afford the adolescent the kind of development he should have in today's world and that they do not enable the teacher to act with maximum efficiency as guide. One group would retain the subjects as the starting point, but delete them of all content not related to the needs and interests of the pupil and enrich them with "vitalized" content, namely, content which does touch the life of the pupil. Another group would use the interests and needs of the pupil as the starting point and draw upon only those portions of organized knowledge which would develop the interests and satisfy the needs. Brewer approaches this second viewpoint, or perhaps goes beyond it, in his statement, "There may be a direct attack, with a curriculum of activities and guidance designed to give children the opportunity to learn living in the laboratory of life."¹ While this viewpoint might suggest the ideal, one seriously doubts that it is practical in the face of deeply entrenched academic traditions and established standards of schooling which for generations have been accepted by the public. Nor could our present generation of teachers, trained under the old order, rearrange the furniture of their minds overnight. New attitudes toward education, new modes of thought, and new techniques of teaching must be acquired by an ever-increasing

¹ John M. Brewer, *Education as Guidance*, p. 3. The Macmillan Company, 1932.

percentage of teachers as the younger generation of teachers replaces the older, before the ideal implied in the concept of education as guidance can be approached. And children taught by the newer methods must mature and in increasing numbers become parents before this ideal will be accepted by the public.

It is of primary importance, therefore, that the student open his mind to the idea that the teacher in a real sense should act as a guide to the pupil. This idea should permeate all the teacher's thinking, and later it should govern his activities as he leads the secondary-school pupil toward the objectives set by society.

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CHAPTER III · Knowing the Individual Pupil and Facilitating His Development in the Secondary School

GENERAL VIEW OF THE CHAPTER

Purpose of the Chapter

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Neglect of This Phase of Teaching in Small Schools

Opportunity to Specialize in Guidance

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Interests

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How to Obtain Reliable Information

Economy in Collecting Information

Relating the Subject to Pupil Need and Interest

Selected References for Further Study

Purpose of the Chapter

THE foregoing chapter outlined the purposes of secondary education and stressed the need for holding those purposes clearly in mind. The present chapter sets forth a fundamental step to be taken by the prospective teacher before he can direct the activities of his pupils toward the desirable goals. It outlines for him the methods of becoming acquainted with the secondary-school student as an individual and of using the subject matter of secondary-school fields to enhance the welfare of the individual pupil. The reader's aim as he approaches this problem should go deeper than mastery of the techniques in theoretical form; his problem is to become able to use them in the classroom. Every exercise performed in the study of this chapter, as in all chapters, should be done with the intention of eventually using the material in a classroom.

The Teacher in Guidance Work

The teacher is the one indispensable factor in any plan for the guidance of pupils. An early writer in the field of guidance designated the classroom teacher as "the key person in any effort to organize a guidance program."¹ A chief weakness of the elaborate plans found in some schools for what is called personnel work is the inability of the *classroom teacher* to understand the significance of the guidance viewpoint or to use the techniques involved. Too often teachers have had little opportunity to learn this phase of their work. This situation cannot be remedied by a superstructure of assistant principals, deans of girls, counselors, and similar functionaries, though such a plan has some points of value while classroom teachers are becoming proficient in guidance work. The pupil can be adequately guided only by those who are in contact with him daily in his various fields of study—his classroom teachers. Any other arrangement divorces classroom work from the life problems of the pupil and makes his schoolwork a set of meaningless tasks.

The teacher with little training in the field of guidance need have no hesitancy in adopting the guidance viewpoint in his teaching. Much of the guidance work in secondary schools has been developed through the learn-as-you-go method; that is to say, according to one authority,² it has developed from experience rather than from theory. Until recently teachers have sensed the pupil's need for counsel and have done their best without a set of well-established principles to follow. Surveys of best practice have in recent years drawn together many helpful suggestions, and much research has been and is being directed toward the unsolved problems of guidance.³ Realizing that many teachers have not yet had the opportunity to pursue college courses derived from such experience and research in guidance, the Department of Superintendence through its Commission on Character Education offers the following practical suggestions for "non-professional counselors." The points will give prospective teachers insights into some of the purposes and practices of guidance.

¹ William Martin Proctor, *Educational and Vocational Guidance*, p. 316. Houghton Mifflin Company, 1925.

² Ruth Strang, *Personal Development and Guidance in College and Secondary Schools*, p. 22. Harper & Brothers, 1934.

³ The book by Dr. Strang, just cited, carries a bibliography of 618 books, monographs, and articles on guidance and closely related problems.

1. The best attitude is one of cheerful, thoughtful objectivity, avoiding pronounced sympathizing, condemnation, or an air of easy optimism or slap-'em-on-the-back.
2. Remember the whole child. While you work for one character objective, take care lest you get undesirable by-products in other character objectives.
3. The child with extreme withdrawing, recessive characteristics is as much a problem in need of individual help as is the child with extreme aggressive characteristics. Too great shyness may mean more potential trouble than too great forwardness.
4. Utilize all readily accessible data, such as those relating to health, school progress, and home conditions. Cumulative pupil records already available in most schools furnish a large amount of valuable information.
5. Avoid treating symptoms. Try to find out why the child acts as he does, and then fit the treatment to the cause of the difficulty.
6. In some cases, the counselee should be kept informed of the purpose of the counselor, and should be appealed to consciously to aid in solving the problem. In other cases the counselee may be kept in partial or complete ignorance of the changes desired in him. The counselor should use whichever plan seems appropriate in any particular case.
7. Single experiences do not afford ground for generalization. Vivid incidents are particularly to be distrusted. Habitual and recurring behavior is the significant source of data.
8. Do not offer authoritative explanations. By the use of other cases and of questions, build up in the counselee his own reasonable interpretation of his behavior.
9. Expect patterns. Among the more common are dependence, fear of the new, avoidance of people, breakdowns, running away from a situation, projecting the blame onto an individual of a given type, and displacement making a mountain out of a given molehill.
10. Do not give advice. Give the experience of yourself and others so far as it is useful, taking particular care to emphasize the differences in the situation faced by the counselee. No two persons have faced exactly the same situation. What the counselee needs is ability to handle situations himself, not advice to follow.
11. Emphasize success rather than failure. Seek to arrange situations which will give the child a taste of success.
12. It is sometimes necessary to study other persons than the one immediately involved. A problem child means at least one and probably two problem parents.
13. It is seldom possible to depend exclusively upon the readjustment of the persons and objects in the environment, or upon the new insight and attitude of the person being advised. Both are usually in need of some readjustment.
14. Keep confidences inviolate.

15. Avoid letting the plans focus on too distant goals without adequate attention to immediate steps. Help the counselee plan on improving adjustment this week, not console himself with phantasy. The past and future exist to enrich the present.

16. Learn to identify early the cases which require a specialist, and be willing to refer them to him.¹

The foregoing statements were prepared largely for the teacher's use in his nonclassroom relations with pupils, but the point of view implied in them should prevail in the classroom as well. Most of the statements are practical classroom suggestions.

Gradually the view reflected in the statements above will become a powerful factor in the selection and rejection of subject matter in our secondary schools. The classroom teacher, as the pupil's main counselor, will select from any given field of knowledge that content which promises to aid the pupil in solving his present problems and those anticipated by the pupil and teacher, and reject that content which can never be of any value to the pupil. The chosen content will be thoroughly mastered under the direction of the teacher in answer to the various needs of the pupil, including the emotional, intellectual, moral, economic, cultural, and physical. The problems of vital significance will thus be answered in the classroom, and the teacher will in a very true sense be performing the function of guidance.

Until the teacher becomes qualified to meet this responsibility satisfactorily, until he masters the techniques and acquires the attitudes of guidance, and until he learns how to relate subject matter to the problems of contemporary life which face his pupils, some artificial system of guidance will continue to be of value as a temporary makeshift in our educational program. Much credit is due the leaders in the field of guidance who are developing the techniques and principles eventually to be applied by the teacher in his daily work with pupils.

Neglect of This Phase of Teaching in Small Schools

There has been a lamentable lack of emphasis upon this viewpoint of teaching in smaller schools. The condition has resulted from the omission of the problem in the courses for undergraduates in teacher-training institutions, from the wide teaching combinations and consequent heavy

¹ A. L. Threlkeld (chairman of the commission), "Character Education," Tenth Yearbook of the Department of Superintendence of the National Education Association (1932), pp. 251-252.

loads of teachers in small secondary schools, from the immaturity of many teachers in such schools, and from the multifarious duties that absorb the time of the principal in the small school. Koos and Kefauver¹ found that in less than a fourth of the schools having fewer than two hundred pupils were the teachers giving serious attention to advising students. These authors discovered that while in many large schools deans of girls, deans of boys, and counselors were active, there was no one in a large proportion of the small schools, except the principal, to supplement this aspect of the teacher's work. When one considers how inadequately the teachers in such schools and even the principals are trained for guidance, one readily sees that this phase of teaching is being largely ignored.

At this point two series of facts revealed in the National Survey of Secondary Education² are of significance. In 1930 there were 1,433,110 secondary-school pupils attending schools in communities having fewer than 2500 inhabitants. These pupils constitute more than 31 per cent of the 4,565,170 secondary pupils in the United States. Thus approximately a third of the secondary-school pupils are in schools which give minor emphasis, if any at all, to a systematic study of pupils. Only a small proportion of these schools have even an artificial system of advisers to fulfill the guidance function of teaching.

The second series of facts uncovered by this study shows that 66.6 per cent of the children of high-school age in communities with more than 2500 inhabitants are attending secondary school, while only 30.9 per cent of the children of that age in smaller communities are in school. That is to say, in the urban communities two of every three are in school, while in the rural communities more than two thirds have left school. It is not here maintained that the failure of the small high schools to serve adequately the needs of their pupils is the sole cause of their greater elimination of pupils. Other factors are operative, such as greater need for work at home, lower economic status, less training of parents, and less popularization of education. But it is suggested that lack of attention to the discovery of real needs and interests of the pupil and subsequent attempts to meet those needs and to satisfy his interests may have been a contributing factor in the elimination. If this be true, certainly a major

¹ From Leonard V. Koos and Grayson N. Kefauver, *Guidance in Secondary Schools*, Parts II-III. 1932. By permission of The Macmillan Company, publishers.

² Grayson N. Kefauver, Victor H. Noll, and C. Elwood Drake, *The Secondary-School Population*, National Survey of Secondary Education, Office of Education Bulletin, 1932, No. 17, Monograph No. 4, p. 6. United States Government Printing Office, 1933.

responsibility of the teacher in the small school or the person preparing to teach in such a school is to become trained to secure personal information about pupils and to be guided in his teaching by that information.

Opportunity to Specialize in Guidance

While it is primarily a function of the teacher to advise and counsel pupils as they progress through secondary school, there will always be need of persons highly skilled in the techniques of collecting information and in the use of statistical methods of interpreting data to facilitate the teacher's work. There will also be need of persons trained to handle certain types of problem cases, particularly those involving mental disease. These functionaries have been added to many of the more progressive public schools in much the same fashion as accessories are added to automobiles. The need is felt, and a new part is added to the mechanism, often without harmonizing it in form and function with the whole machine. Later, as its value becomes established and its function co-ordinated with the general purpose of the machine, it is included in the engineer's original blueprints of the new model and built in to harmonize with the art and aim of the product.

During the period in which our schools are becoming adjusted to the need for greater emphasis on guidance in the classroom, there will be an increasing demand for specialists to train teachers in the schools to perform these duties. After the adjustment has been made, there will still be need of specialists to co-operate with the teachers in the general program of the school, especially in schools in which the classes are large and in those in which teaching combinations are wide. Consequently the prospective teacher with a flair for research and an interest in guidance has the opportunity to concentrate upon this field with a view to specialization after a few years of successful teaching.

Erroneous Conception that Guidance Is Distinct from Teaching

There has arisen in the more wide-awake schools a demand for persons especially trained for advising pupils. This demand has come because teachers have been overloaded, because they have not been instructed to interpret their subject matter in terms of student needs and to adapt their methods to meet those needs, and because needs have been changing

more rapidly than content and method could be changed. Frequently these specialists who have come into the schools have not been assigned teaching duties but instead have been considered as semi-administrative or semi-supervisory officers. This practice has tended to cause teachers — and even more the specialists — to consider guidance as something entirely distinct from teaching.

This seems a very unfortunate view. As stated above, classroom practices and subject matter are already too often alien to the interests and welfare of the student. With the decay of the theory of formal discipline, which formerly caused traditional drill and memorizing to hold a chief place in the classroom, the sole basis for including any given content in a secondary-school subject is its value to the student. And the value of any content is to be measured only by its contribution to the welfare of the student. Unless the teacher understands the pupils' problems, he cannot judge which content will best serve their welfare or what methods should be used in making the service most effective.

The teacher's work is devitalized to the degree that his pupils' problems are handled by others. To that same degree does he become an automaton, mechanically drilling meaningless facts and dead material into pupils' minds. Any practice which accentuates this trend is to be deplored and should be checked and remedied. This can be achieved only when the teachers become able to understand their pupils' problems and to use whatever there is of value in the racial experience, handed down as subjects of study, to aid his pupils in solving those problems wisely.

Need for Knowing the Individual Pupil

Under the traditional system the teacher was considered best who by drillmaster tactics could instill the most facts into the minds of the "scholars." Even today some persons who profess to be teachers hold this view. The modern attitude toward teaching defines the process in entirely different terms. The progressive public-school teacher looks upon his work as a continual discovery and development of pupil potentialities. As the pupil makes progress, the alert teacher will see new possibilities ahead and will guide the pupil into the activities which will enable him to attain those possibilities in the most effective manner. The superior teacher views his pupils as growing personalities and, instead of drilling them in facts which may or may not enhance their develop-

ment, selects the subject matter or the educational exercises which they need individually at their several stages of development.

The traditional regime required the teacher to know a certain amount of subject matter and to possess sufficient force to compel obedience in memorizing facts. Under the newer view the teacher must be so thoroughly a master of subject matter that he understands its implications to life situations met by secondary-school pupils. In addition he must so well understand the lives of those whom he teaches that he will be able to select content when it is needed and to adapt it to satisfy the current needs and interests of each.

Kinds of Information Required

Before the teacher can understand the pupil, at least eight types of information should be at hand at the beginning of the school term and, as soon as possible, in the mind of the teacher. If such information has not been collected in previous years, the teacher should take the steps outlined later in this chapter to procure it.

Personal Data

Essential personal data include date of birth; home conditions, such as type of residence, size of family, approximate income, library facilities and other possibilities for home study; address and telephone number; names of parents if they are living and, if not, a record of that fact and names of guardians; occupation of parents or guardians; nationality of parents and grandparents; record of divorce or separation in family, if any; record of communicable diseases and of insanity or epilepsy in family, if any; church affiliation; health record, including statement of defects of sight, hearing, speech, and all other physical defects the child may have.

Mental Ability

The teacher should have as accurate a measure of the child's mental ability as possible. If facilities are not available for individual mental testing, group mental tests will suffice. Rather than to place full confidence in the results of one group test, it is better to take the middle score on a series of three or even five mental tests, after the scores have been equated in terms of one of the tests. The teacher should be prepared to administer the tests if adequate records are not available in the office of the school.

Scholastic Ability

The marks of each pupil in all previous schoolwork should be available. Not only is it important for the teacher of history, let us say, to know the pupil's past record in history, but it is also important that he know the pupil's record in English, mathematics, and all other subjects as well, in order to have a full understanding of the pupil's abilities and disabilities. Wherever possible the record should include elementary-school work as well as secondary-school work, to make the scholastic history of the pupil complete. In addition to marks, the record should include names of schools attended, attendance record, and disciplinary actions, if any.

Personal Traits

The judgments of previous teachers regarding the non-intellectual traits of each student should be available. These include such traits as accuracy, initiative, dependability, emotional stability, co-operativeness, reliability, industry, ambition, leadership, physical vitality, and others which are noticeably characteristic of the pupil, either by their presence or by their absence. Written records should be made of actual occurrences in which the pupil's behavior in contacts with associates is revealed. Such behavior records give insights into the pupil's personal traits which are very difficult to procure in any other way. As devices for measuring non-intellectual traits are developed, they too should be used.

Special Aptitudes

As early in the school year as possible the teacher should learn of any special abilities the pupil has in music, art, mechanics, writing, or other fields.

Interests

A cumulative record of the special interests should accompany each pupil through his school career. One way of revealing the interests is through the behavior record, suggested above. Hobbies, extra-curricular activities, home interests, and vacation activities of each pupil are illustrative types of interests of which the teacher should know.

Plans

It is important that the teacher know whether the pupil expects to go to college, what occupation he is ambitious to enter, how his vacation is to be spent, and other similar facts relative to the pupil's plans for the future.

Unusual Experiences

Often the knowledge of some unusual experience will be the key to the teacher's understanding of the child, as, for example, tragedies in the family, serious accidents, and other experiences which have deeply affected the pupil. Another type of pupil experience of which the teacher should know includes honors or awards won, trips to points of interest at home or abroad, and other unusual accomplishments or events in the pupil's life.

How to Obtain Reliable Information

In a well-organized modern school information of the types outlined above will be found in the principal's office. All but the strictly confidential should be transcribed to forms supplied by the school or ruled and mimeographed by the teacher, and filed in the teacher's records where it will be *immediately* available when the teacher is planning his work. Many schools use the forms devised by the American Council on Education¹ for elementary and secondary schools, which are available at a small cost.

A slightly more difficult problem confronts the teacher who finds that the principal's office contains no records of pupils except marks and that the school has given little attention to this aspect of the teacher's work. To urge or even to suggest improvements in a school before winning the confidence of the student body and the staff frequently defeats the purpose of the step and brings the beginning teacher into disrepute. To collect all the types of information suggested above and to use them in one's own teaching while others were using strictly traditional procedures would very likely lead to undesired results.

There are certain steps, however, that would be entirely proper. Even before accepting a position, during the personal interview preparatory to election one can learn of the school's view regarding such matters. Some superintendents are eager to obtain the services of teachers with the "guidance" or "personnel" viewpoint to help to establish in their schools the procedures it involves. In such cases or in schools less conscious of the guidance viewpoint in teaching but open-minded toward it, teachers and administrative officers may co-operate in obtaining essential information about pupils. The following practices will make their co-operation effective.

¹ *Cumulative Record Form for Elementary-School Pupils*, \$2.50 per hundred; *Cumulative Record Folder for Secondary-School Students*, \$5.50 per hundred. American Council on Education, 744 Jackson Place, Washington, D.C.

Personal Data

The record form developed by the American Council on Education, already mentioned, provides for almost all data needed for an understanding of the individual pupil. This form may be used, or if preferred one may be mimeographed or printed by the school. In the latter case all the items listed under personal data, on page 54, should be included. The most convenient size for the record form is approximately nine by eleven inches.

The form should be filled by the student when he first registers in junior high school, and it should be filed in the principal's office. Copies of the record of each student may be made on letter-size sheets and sent to each of his teachers for current use.

Mental and Scholastic Ability

Almost all schools preserve records of the pupil's classwork, and an increasing number regularly give intelligence tests. The marks, as a rule, are unreliable¹ and at best give only a crude index of the pupil's achievement. Even so they may be transferred from the records of the school and may be used as a starting point in the teacher's study of the pupil's scholastic ability. Gradually the method of recording a pupil's progress should be improved in accordance with the newer techniques described in Chapter XV of this volume.

Usually the only record of the pupil's mental ability to be found in the principal's office is an estimate of his intelligence quotient based on one test. While this is entirely inadequate, it does provide a rough measure for the teacher's guidance in his study of the child. In no case should a teacher consider a single mental measure conclusive evidence of the child's mental ability. It is particularly unwise to classify a child as subnormal or inferior on the basis of one test unless ample provision is made for reclassification. It is less dangerous to accept a high intelligence record as reliable because a child might frequently fail to do himself justice on a test, but he will never make a score higher than his ability allows. A high score almost invariably reveals high ability, but a low score may frequently result from other causes than low ability.

In a school in which mental measures have not been recorded the teacher may discuss the problem with the principal, or with the superintendent in a small school, and co-operate in administering the tests.

¹ See Chapter XV for a discussion of recording pupils' progress.

It is well to use the same mental test that is used in the entrance program of the college or university which will eventually receive the larger portion of the students who enter college from the given secondary school. If this is not done, the mental measures may not be comparable and as a result an error might creep into the advice given students. The scores of the mental test given in secondary school should be translated into the terms of the test used by the college, if the tests are different.

Personal Traits

Two methods are frequently used to obtain estimates of the personal traits of pupils. The more reliable method is to have several teachers rate each pupil upon a carefully constructed scale and to use the average rating. The second method is that of self-analysis by the pupils, in which each pupil rates himself and is rated by several classmates. The individual's rating of himself is compared with the average of the ratings which his classmates have given him and with the teachers' ratings when they are available. The second method obviously has educational value for the pupil as well as informational value for the teacher.

The scale on the opposite page was constructed for the use of teachers, but it may be used by pupils also.

Each trait should be carefully defined by the group with the aid of the teacher, and the definitions should be learned before the scale is used by pupils. After pupils have become interested in the method, numerous other traits may be added to those in the scale.

As stated earlier in this chapter, brief accounts of the behavior of pupils in ordinary school situations frequently give insight into personal traits that is not obtainable in any other way.¹ The accounts may be written at the convenience of the teacher and filed in the pupils' folders for subsequent use. The values of the accounts, or "anecdotal records," suggested by Randall² are that they supply data for faculty understanding of a pupil, for counseling purposes, for the confidential use of authorized persons outside the school, for curricular changes, and for the

¹ The late E. M. Sipple (director of the Park School, Baltimore, until his death in 1932) used the idea of behavior records in permanent personnel folders as superintendent of schools at Moberly, Missouri, in 1918 while the writer was a member of his high-school staff. More recently it has been developed in other schools and in colleges. See J. A. Randall (president of the Rochester (New York) Athenaeum and Mechanics Institute), "The Anecdotal Behavior Journal," *Progressive Education* (January, 1936), 13: 21-26.

² Ibid. pp. 23-24.

³ (Footnote for chart, p. 59.) W. Hardin Hughes, "General Principles of Rating Trait Characteristics," *Educational Research Bulletin* (February-March, 1925), 3: 9. Pasadena.

GRAPHIC RATING SCALE FOR ATTITUDES AND OTHER CHARACTERISTICS

NAME.....Last.....First.....Middle.....DATE.....Semester.....Year.....

MINIMUM RATING.....AVERAGE.....MAXIMUM RATING.....

INDUSTRY

Works sporadically	Carefully budgets working time
Habitually neglects work	Works regularly and on time
Uses time injudiciously	Makes judicious use of time

0	1	2	3	4	5

ACCURACY

Does inexact work	Accomplishes exact work
Thinks indiscriminately	Thinks discriminately
Expresses ideas incorrectly	Expresses ideas precisely

0	1	2	3	4	5

INITIATIVE

Lacks intellectual curiosity	Evidences intellectual curiosity
Seldom starts anything new	Initiates undertakings
Easily succumbs to difficulties	Finds ways to overcome difficulties

0	1	2	3	4	5

RELIABILITY

Neglects promises and obligations	Fulfills promises and obligations
Inclined not to admit error when wrong	Admits error when shown to be wrong
Is inclined to be unreliable	Is dependable in word and deed

0	1	2	3	4	5

CO-OPERATION

Avoids worthy group activities	Participates in worthy group activities
Does not subordinate self to group	Subordinates self to group
Seems unhappy in teamwork	Seems happy in teamwork

0	1	2	3	4	5

LEADERSHIP

Prefers plans made by others	Plans for and directs others
Fails to secure support for his cause	Usually wins support for his cause
Lessens enthusiasm of the group	Adds to the enthusiasm of the group

0	1	2	3	4	5

PHYSICAL VITALITY

Avoids vigorous activities	Physically active in vigorous activities
Exhibits little physical endurance	Exhibits physical endurance
Possesses physical weakness of personality	Possesses physical forcefulness of personality

0	1	2	3	4	5

INSTRUCTIONS: Keeping the definition of the trait in mind, rate the student between "Minimum" and "Maximum" by placing a check (✓) appropriately on the line. Try to locate the student according to his standing relative to the average for his age. The check may be placed anywhere on the line.

PERSON RATING..... SCHOOL.....³

evaluation of the offering to the individual pupil. Anecdotal records thus supplement other types of information derived by more nearly exact means.

Some skill is required in selecting the incidents to be recorded and in wording the statements so that they will be of maximum value when read later by oneself or others. They should be clear statements of events, uncolored by the observer's opinion as to motives. Specific details should be given first place. Each account should be complete in itself, though brief. Randall presents the following simple episode as a sample of those used in his institution :

Elizabeth asked if she might stay in my room and study during the noon hour. I asked her if she wasn't going to lunch. She said that she couldn't go as she had no money but that it was all right, as she wanted to reduce anyway.¹

Other types of anecdotes are those which include an interpretative statement with an account such as the above and those which add a recommendation to the observation. Also, a teacher may frequently intersperse parenthetical suggestions when writing an account of an incident. The anecdotal record is not intended to be highly objective. It is a subjective description of an observed incident, but it is becoming increasingly important as a supplement to objective data in studying the characteristics and meeting the needs of individual pupils.

Special Aptitudes

It is not safe to assume that by the time a pupil has reached secondary school all his potential special abilities have become apparent in his interests and activities. In many cases they will have become apparent, and in such cases they should be recorded. In addition it is well for the school systematically to give as many of the tests of special aptitudes as are available. Several are treated in the references listed at the end of this chapter, and other tests will appear on the market as they are devised. At present much experimental work is being done in the measurement of special aptitudes.

Interests

The traditional teacher, who placed major emphasis upon drilling pupils in subject matter, was not influenced by the interests of the pupils. The superior teacher of today uses as a key to larger interests those things in which his pupil is already interested. Four means which may

¹ E. M. Sipple, op. cit. p. 22.

be used for discovering the interests of pupils are observations, interviews, questionnaires, and interest blanks. Observation of the actions and school activities of a pupil will reveal many of his interests, and an informal conference with him will lead to the discovery of others. Both methods, though valuable, are time-consuming. The questionnaire, upon which a pupil lists or checks his interests, does not always reveal the more personal interests which are revealed in class discussions or during an interview, but it has the advantage of being easily and rapidly administered. An interest blank of the type presented below has the advantage of determining the degree to which a student likes or dislikes each of the typical interests listed. Pupils who have never checked such a form should receive appropriate directions before giving their reactions.

Any teacher should be able to build from the content of his subject or from his knowledge of pupil interests at least a hundred items of potential interest to a secondary-school pupil. The pupil's reactions will afford the information necessary for a fuller understanding of him.

SAMPLE INTEREST BLANK

(NAME) _____	(DATE) _____					
<i>Interests of Adolescents</i>	<i>Student's Reaction</i>					
	<i>Strongly Like</i>	<i>Like</i>	<i>Indifferent</i>	<i>Dislike</i>	<i>Strongly Dislike</i>	<i>Have Never Done</i>
Reading stories of adventure	---	---	---	---	---	---
Reading historical fiction	---	---	---	---	---	---
Writing stories	---	---	---	---	---	---
Writing poetry	---	---	---	---	---	---
Acting in a play	---	---	---	---	---	---
Playing a musical instrument	---	---	---	---	---	---
(Which? -----)	---	---	---	---	---	---
Seeing a movie based on a great book	---	---	---	---	---	---
Participating in athletics	---	---	---	---	---	---
Studying the habits of birds	---	---	---	---	---	---
Raising flowers	---	---	---	---	---	---
Raising vegetables	---	---	---	---	---	---
Studying the customs of primitive people	---	---	---	---	---	---
Studying how the government is run	---	---	---	---	---	---
Studying the problems of society	---	---	---	---	---	---
Speaking a foreign language	---	---	---	---	---	---
Making a radio set	---	---	---	---	---	---
Making model airplanes	---	---	---	---	---	---

If at the end of the school term the blank is administered again, a rough measure of the pupil's change in interests may be obtained by comparing the two sets of reactions.

Another important aspect of the problem of pupil interests is that of the creation of new interests. That aspect of the problem is not relevant to the present discussion, but it may be remarked in passing that such a blank as that suggested on page 61 would afford a starting point for the creation of interests the pupil had not yet acquired.

Plans and Unusual Experiences

These types of information can best be obtained from the pupil himself, either in conferences or in written form. Items should be recorded on the teacher's folder for the pupil, ready for use as the pupil progresses through the secondary school.

Economy in Collecting Information

The most economical plan for collecting much of the information about pupils is for it to be done only once for each pupil, preferably when he first enters the secondary school, and for it to be made available in duplicate copies for each teacher with whom the pupil works. Such items as marks and extra-curricular participation should be recorded and transcribed regularly, and each teacher should collect additional information, such as interests related to his field, as early in the term as is feasible.

Relating the Subject to Pupil Need and Interest

With this detailed information about the pupil at hand and with adequate mastery of the subject the teacher faces his main problem, that of facilitating the growth of the pupil through proper use of the content. The primary concern is the development of the pupil.

At this point it is well to make it quite clear that much of the content carried in the typical secondary-school courses is valueless to the pupil and should be deleted from the secondary-school offering. The only justification for retaining any given portion of content is that it may serve some need or interest of the pupil. If it cannot pass that test, it should be discarded, and in its place should be substituted content that is worth while. The teacher should have no hesitancy in substituting for subject matter which in no way touches the life of the pupil content which will satisfy one of his felt needs or widen his interests in the field.

This problem should be considered from a viewpoint far enough detached from the activities of school life to enable one to see it in its entirety. From such a viewpoint four main factors are discernible. The first is adolescent youth, spurred by restless energy, overstimulated by a multitude of outside forces, full of desires, hopes, and ambitions, yet confused by the complexity of modern life. The second factor is the series of standards which society has set for the youth to attain, the objectives of the secondary school, the attainment of which will enable the youth to repay society for what it has given him and at the same time enable him to face with confidence the problems of contemporary life and to fulfill his own hopes and ambitions. The third factor is our racial experience, current and recent as well as past and ancient, the great mass of accumulated knowledge ready to be used in helping the youth to reach the objectives which society has defined for him. The teacher is the fourth factor in this wide view of the world of education. His prime function is to guide the activities of the youth toward the objectives, drawing from the wealth of racial experiences whenever it will enhance the youth's progress.

Several practical difficulties face the typical public-school teacher as he attempts to perform this important task. In the first place he is almost overwhelmed by the number and size of his classes. It is not at all unusual for a teacher to have five classes a day, totaling more than a hundred and fifty pupils. Then he is governed by rigid class schedules which must be followed daily. Furthermore, traditions linger in the minds of parents (and teachers) of the way they were taught, and these traditions often present almost irremovable barriers to change, particularly if strengthened by memories of revered teachers. Still another difficulty arises from the way in which knowledge is systematized into almost airtight compartments. Teachers have been trained in these compartments, frequently with interdepartmental jealousies on college staffs preventing even the usual minimum interflow of ideas between subjects. Even teachers of sufficient intellectual capacity to bridge the gaps between fields and integrate knowledge into larger wholes find the secondary-school offering carved into labeled compartments and served up in four Carnegie units a year. These difficulties, though admittedly great, are not insuperable. Two developments which are making definite progress toward overcoming them are the unified, or integrated, curriculum for the secondary school and the clinical approach to the problems of the adolescent. Neither of these two developments can be presented here

in detail, but a brief description of each will give some insight into their purposes and practices.

The unified curriculum in the secondary school unites, or integrates, several fields of study in the attempt to solve the real problems of contemporary life faced by adolescents. Subject-matter walls are leveled, formal class schedules are cast aside, and information relevant to the problem in hand is drawn by pupil and teacher from all sources which offer contributions to the solution of the problem. As the group moves forward in its study of a problem, the teachers in all fields related to the problem hold frequent conferences to outline the procedures and content. The individual teachers direct the activities of the group as the content in their respective fields is being used by the class. As applied in the seventh and eighth grades of the University of Minnesota High School, under the leadership of Dr. O. R. Floyd, principal, the unified curriculum embraces the content usually included in social studies, mathematics, English, and natural science. The content is focused upon the following "seven fundamental needs of man": food, shelter, communication, mobility, co-operation, passing on our heritage, and mental and spiritual life. The method of teaching and learning is the unit method, similar to the system treated in the four chapters of Division II in this volume.

The primary purpose of this departure in educational practice is to meet better some of the present needs of adolescents and their probable future needs by affording them meaningful experiences related to seven fundamental human needs. The problem of the integrated curriculum has been stated as follows by one writer :

Recent economic distress has emphasized the social-civic responsibility of the high school. Secondary education must accept the task of interpreting to the pupils the complicated institutions of modern society in order that in the future social and economic problems may be dealt with more wisely. This task is the clear obligation of education in a democracy. The greatest hindrances to the attainment of this objective are the failure to recognize this responsibility and the tendency to conceive the aims of education in terms of subject matter. Each of the subject matter fields represents a valuable means for interpreting social institutions. Typically, however, these media have been considered largely as ends in themselves. . . . Integration of the various subjects has been proposed to remove this emphasis upon the subjects and to facilitate a direct approach to the attainment of the purposes of the school.¹

¹ Oliver R. Floyd (principal, University of Minnesota High School), "Selecting and Organizing the Content of an Integrated Curriculum," *The School Review* (October, 1936), 44: 577-585.

A second development of recent years which attempts to solve the problems of secondary education more adequately than has been done under the typical teacher-pupil relationship is the clinical, or case-study, method. Like the unified curriculum, it is making definite progress against the difficulties which arise as the teacher attempts to use the racial heritage in guiding the adolescent toward the objectives of secondary education. The method was derived from several sources, including the social fieldworkers, the psychiatrists and others in various child-guidance clinics, and the visiting teacher who modified the method when introducing it more widely into the schools.

The case-study method uses the guidance viewpoint described earlier in this chapter and the various types of data outlined above. Its first aim is to get as complete a record as possible of the hereditary and environmental influences which have borne upon the child and of his resultant behavior. This record is used as the basis for explaining his present actions and for selecting the program of activities best suited to his development.¹ The case-study method has been highly successful in problem cases in both elementary and secondary schools. It has been largely limited to such cases in the past because of the time required for studying and treating each case and because of the limited number of teachers with some training for the work. The techniques developed in the work with problem cases have been found valuable in regular school-work in adjusting the offering of the school to the needs of the individual pupil.

An illustrative case will suggest the possibilities of applying to classroom activities some of the techniques of the case-study approach. The illustration was drawn from a small school in which the teachers were little trained in guidance but were seriously doing their best to meet the needs of the individual pupils.

PUPIL No. 23

PUPIL <i>Leo P.</i>	GROUP <i>IV</i>	UNIT <i>I</i>	ANCIENT HISTORY
RACE <i>Polish</i>	ENVIRONMENT <i>Poor</i>		EFFORT <i>95%</i>
MENTALITY <i>Average to slow</i>			INTEREST <i>High</i>

Individual Analysis. Physical handicap — intelligence higher than shown on tests. Probably a good average ; improvement continuous throughout course.

¹ See Caroline B. Zachry, *Personality Adjustments of School Children*, p. 5. Charles Scribner's Sons, 1929. See also Marion A. Brown, "Organization of the Dean's Work in the Secondary School," Chapter III in *Deans at Work* (edited by Sarah M. Sturtevant and Harriet Hayes). Harper & Brothers, 1930.

Few home advantages. Little social life, extreme effort to get education. Extremely honest, reliable, and willing. Handicap in speech. Poor writer due to physical handicap. Untidy in work — very conscientious. Slow reader, but thorough. No home reading. Native tongue spoken in home. Does fair work in the rest of his studies. Hopes to continue education beyond high school. Extreme effort might carry him through. Conscious of being unorthodox in race and religion. Has to work hard at home, but a consistent student with desirable study habits. Will develop lasting reading habits with the right stimulation. Prone to become discouraged if not given encouragement and sympathy.

Interests. Interested in history and current questions if given a chance for self-expression. Interested in knowing about the background to races and nationalities. Carries a subconscious interest common to European suppressed nationalities. Interest in early history of man, in foundations of Europe, in Hunnish invasions of central Europe, in temporary alignments of nations since the war. Conscious of new Polish republic. No religious or racial sets against other Europeans. Interested in knowing the traditional background of America.

Assignments. Should not be too extensive, or readings required too lengthy. Will do thorough reading, but too much will lead to confusion. Difficulty — assignments should be average. Emphasis on selection of problems, fewer in number; where continuance of study is rewarded, will be honest in selecting problems which he needs and in which he is most interested.

Individual Assignments. He will carry out and be interested in project work. Somewhat of a student of his surroundings.

Environmental Improvement. Given access to school magazines and newspapers, will do varied and worth-while reading. Has desire to take periodicals home. Encouraged home discussion and home reading. Younger sister is intelligent and will attend school here. He is interested in helping her and will become conscious of needs for more desirable home environment.

Student Problem. Improve home environment — greater sympathy, access to learning possibilities, guidance in reading. Help in evaluation.

Assignment for One Semester

1. The student should master the minimum essentials of all the major problems in the plan for the semester.
2. In addition he should pursue the following subproblems, all of which have been selected from the general semester plan to fit his individual needs:

From Problem

I
II
III
IV
V

Subproblems

6-7-8-9-11
3-5-11 and parts of 12
2-4-5-6-11
1-4-9-10, assigned unit 12
1-2-6-7, assigned unit 12

From Problem

VI
VII
VIII
IX
X
XI
XII
XIII
XIV
XV
XVI
XVII
XVIII

Subproblems

4-5-6-10, assigned unit 12
1-3-5-8-9, part *b* of 12
3-4-2-9-11
1-3-2-5-8, assignment 12
1-7-6-11, assignment 12
2-5-6-10
3-4-8-9-11
2-3-4-8-9, assignment 12
3-6-9, assignment 12
1-5-8-9-10
3-4-5-8-11, assignment 12
1-3-5-6-11
3-5-7-9, part *a* of 12

In this particular assignment for the first semester in ancient history the student chose a larger percentage of the subproblems which included home reading in magazines or newspapers. Sunday sections of papers, giving stories of excavations of historic ruins, etc., were utilized. A noticeable interest was developed on the part of the parent (father) by those home-reading assignments, since the boy brought in requests for reading matter to be taken home. Before the first semester had passed, the parents had subscribed to a daily English paper and were doing considerable reading and speaking in English.¹

The unified curriculum and other curricular innovations and the case-study approach in method are making definite progress in the secondary school. The general task of leading the adolescent toward the desired objectives has been facilitated by these two developments.

The guidance viewpoint, already discussed to some degree and presented in the succeeding chapter in connection with pupil adjustment, is fundamental to both developments. Once gained by a teacher, this viewpoint will influence all his teaching activities. He will not resort to the older formalized procedures which in many schools have made the pupil's work both burdensome and meaningless. Instead he will use the practices which place the pupil's needs first. For example, in planning the instructional activities the formalized procedure would begin with a certain amount of content to be studied by all alike, irrespective of the individual pupil's needs, whereas under the guidance viewpoint the starting point would be the pupil, whose abilities and disabilities in the field and whose traits, aptitudes, and attitudes in general are known to the teacher. Under the old the planning would consist of preparing a

¹ Selected from Paul S. Amidon, *An Analysis of the Administrative and the Instructional Program in the Schools of Upsala, Minnesota, for the Years 1926-1931*, pp. 206-208. Unpublished master's thesis, The University of Minnesota, 1934.

series of procedures which would ensure mastery of the content, whereas under the new, while the general practice of devising a series of procedures would be carried out, the procedures would differ because the teacher would first analyze the pupil's abilities and then seek to develop them through relating the content to his needs and interests. The extent of the deviation from the typical practice of a given school which a teacher with the newer viewpoint will need to make in his planning procedures will obviously depend upon the degree to which the offering of his school has already been modified from the formalized lines. Some progressive secondary schools have entirely remodeled their offering to conform with the new viewpoint. In such cases the teacher in his planning will be guided by careful analyses of pupil abilities. Other secondary schools still rigidly adhere to formalized content and methods. In those schools the teacher should attempt, as stated earlier in this chapter, gradually to prove the greater value of the newer viewpoint, in part by planning his instructional activities to deviate from the traditional as much as is feasible in the given situation.

In the extra-curricular activities of the school the relation of activity to pupil interest and need is usually more clearly apparent than in curricular activities. Gradually the interesting activities falsely classified as extra-curricular should be drawn into the regular work of the school to enrich and enliven and, to a degree, replace the content and activities of the typical classroom. Activities of interest and value to the adolescent should not be falsely labeled "extra"; they should be admitted to the regular program of the school as rapidly as their value can be established. Thus the work of a biology club deserves a place in the regular classroom because it has been established that such activities make for abiding interests in nature and the out-of-doors. The expressions "extra," "co-," or "allied" should be eliminated, and all activities of value should be absorbed by the regular program of the school.

Since the beginning of the century the extra-curricular program has come into prominence as an aspect of the rebellion against the lifeless formalized practices which had become so deeply entrenched in our secondary schools that experiences of vital significance to youth could find no place in the regular program. That rebellion continues. In a rather true sense there are two rival camps in our secondary school: the curricular and the extra-curricular. The situation is anomalous. Its solution lies in merging the two sets of activities and in following a mid-course between the inflexible, lifeless classroom procedure of the formalized school

and the chaotic, unsystematic offering which would follow if the entire work of the school were based upon activities similar to the present-day extra-curricular program.

This shift toward a more liberal mode of instruction, based upon the pupils' needs and interests, can be made without the "scrapping of the secondary-school curriculum" that some educators advocate. There is much in the old that is good. That part should be preserved. The old also contains much that is obsolete. That should be discarded, and in its place should come the things of vital significance to the adolescent in the present-day world. Those things are now being introduced by the superior teacher in the progressive public schools of this and other lands. This transitional process will be accelerated as newcomers with the guidance or case-study point of view toward teaching enter the ranks of the profession.

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CHAPTER IV · Pupil Adjustment in the Secondary School

GENERAL VIEW OF THE CHAPTER

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The Problem of Pupil Adjustment

Opposing Viewpoints in Pupil Adjustment

The Viewpoint of Mental Hygiene

Causes of Poor Pupil Adjustment

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The pupil

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Methods of Promoting Proper Adjustment

Preventive

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Selected References for Further Study

The Student's Aim

MANY students of education look forward to their first year of teaching with some misgivings as to their ability to gain the pupils' co-operation and to maintain a wholesome learning situation. They recall instances from their own high-school days in which pupils injured both themselves and the school by failing to adjust themselves to school conditions. In some of these cases, no doubt, the reader, recalling the facts, will believe that the teacher and the school were as much to blame as the maladjusted pupils.

Such a prospective teacher will approach the study of pupil adjustment with the hope of finding a satisfactory analysis of the basic causes of

improper adjustment or "misbehavior" or "poor discipline." He will wish also to acquire an understanding of methods for preventing maladjustment by eliminating the causes. Furthermore, he will expect to learn how to treat cases too far along to yield to preventive measures.

The Problem of Pupil Adjustment

There are two main aspects of the problem of pupil adjustment. The first is the pupil's adjustment to the school, and the second is the school's adjustment to the pupil. Before 1920 the second phase of the problem was largely ignored and the first greatly overemphasized. The mounting enrollments and the increasing numbers of students from lower-ability levels have made it clear that many pupils cannot be forced to fit the traditional scholastic molds and consequently that adjustments in the offering must be made if the pupils are to profit from attending the secondary school.

Considered in this double meaning, pupil adjustment includes all types of activity in the secondary school in which the pupil may be out of harmony with his environment. One group of causes for the discord lies with the pupil; another group lies outside the pupil, in his surroundings. It is the teacher's problem in pupil adjustment to establish and maintain harmony in all the school activities. His task is to establish harmony, where discord prevails, by the use of proper remedial treatment; and to maintain harmony, where it already exists, by the wise use of preventive practices and measures which suggest only the positive and proper behavior.

Opposing Viewpoints in Pupil Adjustment

As the teacher attempts to make a harmonious adjustment between the pupil and the school, he is confronted immediately with two conflicting viewpoints regarding the teacher-pupil relationship. At the outset of his problem, therefore, he should analyze the two viewpoints and choose the one which is to direct his activities. The repressive and the newer viewpoints may be analyzed as follows:

Viewpoint of Repression

Consider the subject first.
Demand verbatim learning.
Impart knowledge for its own sake.
Control.

Viewpoint of Expression

Consider the pupil first.
Stimulate creative thinking.
Impart knowledge for growth in power.
Develop.

Viewpoint of Repression

Suppress.
 Punish disobedience.
 Enforce inhibition.
 Consider human nature bad.
 Establish rigid rules of behavior.
 Be autocratic.
 Punish failure to learn.
 Consider the offender a criminal.

Viewpoint of Expression

Guide.
 Encourage obedience.
 Permit expression.
 Consider human nature good.
 Permit reason to rule.
 Be democratic.
 Re-create.
 Consider the offender a patient.

The viewpoint a teacher selects in some measure determines the degree of his success in teaching, but it should be clearly realized that the newer viewpoint is the more difficult to apply. It was (and is) relatively simple for the tyrannical schoolmaster, largely ignorant of subject matter and entirely ignorant of psychology, to force human subjects to conformity by fear and by free use of the hickory stick. Given both a thorough mastery of content and a sound understanding of method, to guide the development of adolescent youth toward better human relationships is a task which demands the highest talent.

The Viewpoint of Mental Hygiene

Since 1900 the rapid development of psychology and psychiatry has brought increased attention to the problem of the mental health of the pupil. Forms of behavior which deviate from the normal and wholesome have been subjected to clinical study. No small number have responded favorably to remedial treatment. Many behavior deviations or maladjustments have been traced to such types of bad mental health as excessive worry, abnormal fears, unsocial attitudes, or feelings of inferiority. Others have been found to arise from the pupil's attempt to compensate for physical deformities. Still others result from lack of emotional control or from actual injury to the nervous system, especially the brain tissue.

To charge all forms of misbehavior to original sin, or in somewhat more modern terms to "pure cussedness," is obviously a reaction not to be condoned in any school. The teacher must first consider the unusual behavior as a symptom of a mental condition to be studied, diagnosed, and treated, either by himself or with the aid of someone with more specialized training. Such practice places pupil adjustment upon a scientific basis and applies the principles of mental hygiene.

The teacher himself is not always free from abnormal mental conditions. Restraints set up for the teacher by society prevent the natural

expression of certain normal and wholesome emotions. This frequently results in tenseness in the nervous system and subsequently in various types of mental ailment. Teaching loads which are too heavy and the threat of reduction or entire elimination of income, both of which become common during periods of general economic stress, lead to premature depletion of nervous energy and to various types of neurosis. Long tenure in subordinate positions, such as classroom teaching, sometimes results in unduly severe treatment of the only persons over whom control may be exercised, the pupils. As the first step in safeguarding the mental health of his pupils and to protect his own mental health the teacher should understand the effect of these factors and other similar ones and guard against them. "Erratic, crabbed, irascible, or morose persons exert a baleful influence on their associates and so reduce the capacity of the entire organization."¹ Several works on mental hygiene, which are listed at the end of this chapter, will offer an introduction to that absorbing field of study.

The importance of the pupil's mental health in the work of the teacher is clearly stated by Burnham :

The mental health of the pupil is the teacher's supreme concern. To conserve the wholeness and wholesomeness with which a normal child is endowed; to develop an integrated personality at higher and higher levels; to preserve right mental attitudes; to train in habits of healthful mental activity; to prevent mental disorders; to give opportunity for significant and healthful activity, — this is the teacher's great function.²

Causes of Poor Pupil Adjustment

In any given school a variety of forces influence the pupil's reaction to his work. Some are conducive to proper adjustment and facilitate the pupil's progress, while others are destructive in their tendencies. At this point in the analysis of the general problem of pupil adjustment it is important that the forces which tend to disturb pupil adjustment and to make for discord be studied somewhat in detail.

The Community

Several years ago the writer visited two communities on successive nights during commencement week. In the first community high civic

¹ Laurence H. Mayers, M.D., "Weeding Out Emotional Defectives from the Teaching Ranks," *The Nation's Schools* (October, 1934), 14: 37-38.

² William H. Burnham, *Great Teachers and Mental Health*, p. 1. D. Appleton-Century Company, Inc., 1926.

interest and a spirit of co-operation were reflected in every action of the school and the patrons. Students and parents came early and chatted pleasantly in groups, awaiting the signal to enter the building. Several men ushered the superintendent and the board of education from group to group and conversed intelligently about various school problems. Not a note of discord was heard. During the exercises of the evening several community organizations took active parts. Each of the four religious leaders of the community had a minor duty to perform, and all were accorded equal respect by the audience. At adjournment the patrons were sincerely enthusiastic in their congratulations to the seniors and teachers, and remained in the building talking with them, apparently reluctant to leave. The superintendent, when questioned as to the reason for the unusually fine spirit of the community, said that the source was in the community itself rather than in the school, that the community was law-abiding and had sound faith in the value of education, and that in all civic, religious, and educational activities an attitude of co-operation or at least of tolerance had prevailed for more than a generation.

The chief occupation of the second community, according to its superintendent, was bootlegging. Several superintendents had been "run out," but the one then in charge, an ex-sergeant of marines, calmly stated in marine language that the chances of his remaining were rather good since it was improbable that he should "get soft." He said it was well known to the pupils of the school that the town officials were in league with the makers of "moonshine" and aided in its illicit distribution. The commencement exercises opened with a few remarks from the side of the superintendent's mouth. In the midst of his announcements he shot a hard look at the seniors to quell an annoying disturbance. The crowd straggled in noisily throughout the program. The president of the board of education arrived as the address of the evening ended. The superintendent hastily handed out the diplomas, and the audience after scant applause to the class immediately disbanded, no one except the teachers congratulating the class. The superintendent explained that local bootlegging gangs were at war, that the local churches were constantly in such conflict that it had become inadvisable to invite any of the leaders to participate in the school programs, and that the general moral tone of the community was so low that immoral relations among the students had become a major problem of the school.

In the first community, there were few pupils who were not in accord with the school or interested in their work. The whole community lived

on a high plane. The superintendent said that the teachers very rarely met with serious problems of pupil adjustment. In the second community, the actual control of the pupils was the chief problem of the school. There was no time to consider the finer adjustments of personality which were studied and cared for in the first school; they went unnoticed in the smoke of the battle.

The effect upon the school of the interplay of community forces should be given careful study in each community as a basis for a full understanding of the pupil. These forces arise from attitudes regarding religion, race, nationality, political creed, social philosophy, and so forth. All these are influenced by the general moral tone of the people and by the general spirit of co-operation or conflict which prevails in the community. An understanding of the composite of the local situation as well as of its parts is prerequisite to a full appreciation of the problem of pupil adjustment in any given school.

The Home

"All our clinical studies of maladjusted children point to the family as the most potent influence in the child's life."¹ Among the factors in the home which disturb proper pupil adjustment are incompatibility of parents; absence of one parent or both by death, separation, or divorce; antisocial attitudes; extreme prejudices of any type (sectional, racial, religious, political); excessive worry of parents resulting from any cause, especially that of economic insecurity; traditional concepts of the school which place fear as the chief motive force and emphasize antagonism as the typical teacher-pupil attitude; and unwillingness to co-operate with the school. These factors and others in the home environment often give the child a background which makes it almost impossible for him to become adjusted to school life. The teacher who is not aware of a given pupil's home conditions is therefore often unable to isolate the cause of the behavior deviation.

A teacher in the eighth grade of an average-sized railroad center became annoyed because one of the girls in her class repeatedly failed to prepare her classwork. The usual methods of motivation were unsuccessful, and finally the teacher reported the case as hopeless. The child, she said, was "lazy and stupid." A study of the home revealed that the mother had died two years before and that the fourteen-year-old lazy

¹ Ernest R. Groves and Phyllis Blanchard, *Introduction to Mental Hygiene*, p. 200. Henry Holt and Company, 1930.

and stupid girl was the housekeeper for the family of five. She arose at five o'clock, prepared her father's breakfast, packed his lunch, then called the three younger children, prepared their breakfasts and helped them to get ready for school, hastily washed the dishes and made the beds, then rushed to school. At noon she hurried home, prepared lunch for the four, set aside the dishes, and returned to school. Immediately after school she resumed her kitchen work, prepared and served the evening meal, and spent the evening at housework. When the teacher learned these facts, her entire attitude toward the girl changed immediately to one of respect and good will; and eventually a strong mutual friendship developed.

The School

The prevailing mode of school government, the attitude of the staff toward the function of the school, the kind of subjects taught, and the method of instruction are some of the factors within the school itself which affect pupil adjustment. As a general rule serious behavior deviations are more likely to occur in a school with a dictatorial method of government than in one in which students are permitted to participate to some extent in the government. Staffs with an appreciation of the wider social aims of the school are more likely to sense and to correct maladjustments than staffs whose ideals of education are limited to formal discipline and the mastery of subject matter. There will usually be less friction in a school which attempts to adjust its offering to the ability and needs of the pupil than in one which rigidly adheres to the traditional subjects. Schools in which method is largely limited to drill will be faced with more misfits than schools which have gradually socialized their methods. There will be exceptions to each of the statements above, but in the main the environmental influences in the unduly formalized school will react unfavorably upon the pupil, making his adjustment more difficult.

Mental hygienists have recently stressed the point that the typical mode of instruction is frequently detrimental to the mental health of the student. Particularly vigorous is their condemnation of harsh methods of discipline and of rigid examination and marking systems as causes of emotional maladjustments. One mental hygienist protests as follows against certain examination practices:

Among such practices are: placing undue emphasis on the value and outcome of tests and examinations; openly announcing to the students that every-

thing depends on the examination; threatening them with dire consequences unless they return exceptionally fine papers; predicting that some students are doomed to fail because, axiomatically, those who fall at the bottom of the curve of normal distribution of intelligence do not have and never can acquire ability enough to reach a passing standard; the display of favoritism or personal likes or dislikes, openly shown or ill-concealed; permitting "bootlicking" to influence results; and the like.

To the mental hygienist any instructor who is so lacking in the most elemental conception of the demands of the mental hygiene of instruction as to proclaim openly in class that he must inevitably "flunk" a certain percentage of his students is guilty of educational malpractice. It is questionable whether he should be permitted to hold a position which enables him to inflict irretrievable injury upon the mental life of defenseless youth.¹

An aspect of this general problem is the influence of the teacher's characteristic reactions upon behavior deviations, discussed in the following section.

The Teacher

It is quite clear that the teacher himself may be a major factor in causing serious behavior deviations. A study in this field² reveals marked differences between teachers and mental hygienists in their attitudes toward maladjustment and strongly suggests that the typical teacher's reaction to behavior deviations actually causes the deviations to become more marked. The variance of the teachers and mental hygienists with respect to the seriousness of several kinds of behavior problems is revealed in Table 3. In general the teachers considered most serious the behavior deviations which were of the "attacking type." Especially serious were those which challenged the authority of the teacher or were in any way disrespectful of constituted authority. Less concerned were the teachers about the "withdrawing types" of behavior, such as shyness, unsocialness, sensitiveness, and fearfulness. The mental hygienists, on the other hand, placed only four kinds of "attacking" behavior in the twenty items of highest average rank for seriousness. To them the problems of the withdrawing type were the more important kinds of maladjustment, particularly those associated with such traits as unsocialness, suspiciousness, pensiveness, and fearfulness.

¹ J. E. Wallace Wallin, "Scholastic Pottage," *Progressive Education* (March, 1936) 13: 179-187.

² E. Kosker Wickman, *Children's Behavior and Teachers' Attitudes*. The Commonwealth Fund, Division of Publications, New York, 1928.

TABLE 3. THE VARIANCE OF TEACHERS AND MENTAL HYGIENISTS UPON THE RELATIVE SERIOUSNESS OF SEVERAL KINDS OF BEHAVIOR PROBLEMS¹

Type of Problem	Average Ratings of 511 Teachers	Average Ratings of 30 Mental Hygienists
Heterosexual activity	17.3 ²	9.9
Stealing	17.0	12.5
Masturbation	16.7	6.4
Obscene notes, talk	16.6	8.8
Untruthfulness	15.8	10.3
Truancy	15.6	10.3
Impertinence, defiance	15.0	7.1
Cruelty, bullying	14.8	13.5
Cheating	14.7	10.3
Destroying school materials	14.3	5.1
Disobedience	14.1	6.4
Unreliableness	13.9	10.4
Temper tantrums	13.0	11.7
Lack of interest in work	12.8	9.6
Profanity	12.3	2.9
Impudence, rudeness	12.2	7.6
Laziness	12.2	7.2
Smoking	12.0	2.3
Enuresis	11.8	9.2
Nervousness	11.7	11.3
Disorderliness in class	11.7	3.4
Unhappy, depressed	11.5	16.2
Easily discouraged	11.5	13.4
Selfishness	11.3	11.8
Carelessness in work	11.3	7.1
Inattention	11.2	7.3
Quarrelsomeness	11.1	8.3
Suggestible	11.0	13.3
Resentfulness	10.8	14.1
Tardiness	10.5	5.6
Physical coward	10.4	12.0
Stubbornness	10.3	10.9
Domineering	10.3	13.0
Slovenly in appearance	10.1	7.2
Sullenness	9.9	12.6
Fearfulness	9.7	14.0
Suspiciousness	9.1	16.4
Thoughtlessness	8.7	6.8
Attracting attention	8.5	8.5
Unsocialness	8.3	17.3
Dreaminess	8.3	11.3
Imaginative lying	8.1	7.5
Interrupting	8.0	2.8
Inquisitiveness	8.0	5.3
Overcritical of others	7.9	13.2
Tattling	7.5	8.8
Whispering	7.5	0.8
Sensitiveness	7.0	13.1
Restlessness	6.9	6.4
Shyness	5.4	12.5

¹ Derived from E. Kosker Wickman, *Children's Behavior and Teachers' Attitudes*, Charts XVI-XVII, pp. 124-125. The Commonwealth Fund, Division of Publications, New York, 1928.

² The scale for rating the problems ranged from 0 for those of no significance to 20.5 for extremely grave problems.

The accusation is made in this study that teachers in their typical reactions to behavior problems increase the seriousness of problems of both types. The typical reaction to the attacking type is counter-attack. This further annoys the attacker, and he attacks more strenuously later. On the other hand, the withdrawing type of child is frequently referred to as a model of behavior, which causes him to withdraw into his shell still further. Wickman ¹ makes this summary in italics :

By counter-attacking the attacking type of problems and by indulging the withdrawing types, the underlying difficulties of adjustment in each case are increased and the undesirable expressions of social behavior are further entrenched.

Reference has already been made to good mental health of the teacher as a prerequisite to good mental health of the pupil. For example, nervousness and irritability on the part of the teacher are quickly reflected by the pupils. More serious behavior deviations of the teacher give rise to correspondingly greater deviations by the pupils.

From the foregoing it is quite clear that the teacher should first remove from his own actions possible causes of pupil behavior deviations before assuming the cause to lie in some defect of the pupil.

The Pupil

After all exterior causes of pupil maladjustment have been analyzed, however, there still remain within the pupil himself potential sources of misbehavior. Whether these have resulted from earlier exterior causes or from innate tendencies, the fact remains that they are present when the pupil enters a given classroom or school activity, and they must receive proper treatment.

1. *Physical causes of maladjustment.* Any physical disability may lead to improper adjustment unless the teacher takes it into consideration in his treatment of the pupil. For example, often a pupil with poor eyesight is decidedly handicapped without knowing it. Since he has never seen through any other eyes than his own, he thinks he sees all that other pupils see. As a matter of fact, for example, he may not see all of an assignment placed on the blackboard. If in such a case he should be called to task for not doing the work, he would consider himself unjustly treated, not knowing that the work had actually been assigned. Occasional recurrences would cause the teacher to mistrust the pupil, thereby increasing the feeling of injury. Soon the student would develop ill will or even a strong hatred toward the school, especially if he had spirit.

¹ Op cit. p. 171.

A similar situation might result with a pupil with poor hearing. In either case the teacher, learning of the defect, might win the pupil's friendship by having the defect corrected or by considering it in later contacts with the pupil.

Other types of physical disability which the teacher should consider in his study of the individual pupil are malnutrition, the possibility of actual hunger and consequent weakness, and any physical handicap or deformity which might make the pupil sensitive. The teacher should also be able to detect gross symptoms of the more common diseases, any one of which would obviously be a cause of maladjustment until discovered and remedied.

If a record of physical disability is not available in the central office of the school, it becomes the teacher's responsibility to discuss the problem with the principal or the superintendent. Every school community should provide careful medical inspection. Where it is not provided, the teacher is handicapped, but he is also obliged to take proper steps toward having such a practice established.

2. *Endocrine irregularities.* Much attention has been given to the relation of the endocrine, or ductless, glands to physical and mental health and to personality. The subject of endocrinology is far too technical to be discussed in detail except in medical treatises, yet it is too important to the teacher to be entirely ignored in a discussion of pupil adjustment. That certain irregularities in the endocrine glands may produce in a pupil physical or mental conditions which make his adjustment to the school situation impossible is a scientific fact. When the glands function normally, a proper chemical balance is preserved. But when one or more glands become defective through disease, injury, or other cause, the balance is disturbed and any one of numerous physical or mental deviations may occur. These cases range from mild forms of abnormality to monstrosities with few human traits. The secondary-school teacher faces fewer cases of pronounced deficiency than the elementary teacher, but many of the behavior deviations he meets arise from abnormal activity of these glands or from adjustments which occur at adolescence.

With the advent of puberty provoked by the sex hormones of the pituitary gland, the individual enters upon the second great phase of life. The provocation of gonadal activity at puberty introduces an entirely different endocrine activity and group of endocrine disorders.¹

The endocrine group includes the thyroid, the thymus, the adrenal, the pituitary, the pineal, the parathyroid, and the sex glands. Not all the functions of each of these ductless glands are known to science, but

¹ From William Engelbach, *Endocrine Medicine* (1932), Vol. III, p. 3. Courtesy of Charles C. Thomas, Publisher, Springfield, Illinois.

much of what is known is of significance to the teacher. A few illustrations will suggest this significance and stimulate further reading and study.

There is clear-cut clinical evidence that underactivity of the thyroid (hypothyroidism) results in myxedema and sporadic cretinism.¹ Typical symptoms of underactivity are fatigue, depression, and mental sluggishness and retardation. Severe hypothyroidism (myxedema) results in a thickening of the skin, especially of the face and eyelids.

The features are coarse, the eyes are puffy, the hair is dry and coarse, and frequently very sparse. The speech may be slow, and the patient gives the impression of slow cerebration, the memory being especially poor for recent happenings. If left alone for a short time the patient may fall asleep. The mood is usually quiet and placid but melancholia and depression with marked anxiety may be present. The patient is always physically tired and frequently complains of soreness and stiffness in the muscles and joints. In spite of being overweight the patients suffer from cold. The nails are brittle and rigid. The pulse is slow and the blood pressure is low.²

Overactivity of the thyroid (hyperthyroidism) likewise has characteristics many of which may be observed in almost any classroom. The author just quoted continues, p. 105 :

Emotionalism is a prominent symptom. The emotions are quite easily aroused, running an intense course and ending abruptly. As a corollary there are irritability, quick response, high speed activity. . . . Some part of his body is usually in motion — he cannot sit quietly and relax. . . . Indeed in the severe cases a true mania or delirium may be present. The patient shows a striking inability to concentrate. . . . All the special senses are stepped up in acuity.

More direct evidence of the significance of the endocrine balance to the adjustment of the pupil is afforded by an experiment conducted in the Detroit public schools.³ Special treatment was given 347 retarded pupils diagnosed as cases of pure thyroid deficiency (hypothyroidism) and another group with pituitary deficiency. In former years before the experiments were launched observation had shown that the I.Q.'s of such pupils had dropped 20 or 30 per cent during the entire elementary-school life. This fact gives even greater meaning to the following results of the treatment conducted over a period of approximately two years :

¹ John G. Rockwell, "The Thyroid Gland," *The Psychological Bulletin* (June, 1928), Vol. 25, No. 6, pp. 341-360.

² George Crile and associates, *Diagnosis and Treatment of Diseases of the Thyroid Gland* (1932), p. 90. Courtesy of W. B. Saunders Company.

³ James Marinus Carleton, M.D., "Retarded School Children Improved by Glandular Treatment," *The Nation's Schools* (August, 1933), 12: 11-15.

... twenty-four or 12.6 per cent have shown a rise in I.Q., 150 or 78.9 per cent have shown a stationary I.Q., 16 or 7.8 per cent have shown a falling I.Q. It will be observed that this is a reversal of the normal trend in these cases, more than three-quarters of them maintaining normal mental development with less than 10 per cent failing to develop mentally at a normal rate.

The same clinic studied

... 66 supposedly normal children handicapped by disturbance in speech with following observations: thyroid deficiencies, 40 or 60 per cent; pituitary dysfunctions, 11 or 17 per cent; birth injury, 2 or 3 per cent; no possible diagnosis, 13 or 20 per cent. In the forty placed upon treatment the following changes were noted: improvement in physical conditions, 33 or 82.5 per cent; improved school progress, 18 or 45 per cent; marked improvement in school progress, 7 or 17 per cent; marked improvement in speech progress, 20 or 50 per cent; little improvement in speech progress, 17 or 42.5 per cent; no improvement in speech progress, 3 or 7.5 per cent.

The pituitary cases did not respond to treatment as favorably as the thyroid.

The cases of pituitary deficiency had shown no real improvement upon treatment insofar as the intelligence itself was concerned. There was an alteration of personality with some degree of increased achievement in school work. . . .

Reference has been made to the endocrine disorders incident to the advent of puberty. The psychological accompaniments of this period of physiological disturbance have been overstressed by some writers, a fact which has given rise to much discussion without many generally accepted conclusions. The physical changes alone, such as change of voice, the appearance of the secondary sex characteristics, and increase in strength, may cause minor maladjustments and certainly demand a change in classroom control. Unless ample activities are afforded to sublimate the normal sex force, perversions may develop, causing serious maladjustments of the pupil.

The functions of other endocrine glands are less well known, and consequently their influence upon pupil adjustment is less easily traced. Enough has been said, it is hoped, to make it quite evident that the teacher with a modern viewpoint toward pupil adjustment will, in his study of any pupil, hold in mind the possibility that the cause of the maladjustment may be found in some endocrine irregularity. In a real sense he will look upon the pupil as a patient.

3. *Mental health.* The mental health of the pupil is closely associated with physical and endocrine disabilities in two ways: the organic and the functional. By organic is meant actual impairment to the higher nerve centers through injuries, disease, or deficiency in sustenance. Illustra-

tions of this type would be severe head injuries, paresis in the case of an adult, and lack of thyroid secretion or extreme physical debility from malnutrition. The functional would include forms of bad mental health arising from ideational causes, as, for example, extreme sensitiveness because of the thought that classmates were ridiculing any given physical deformity or disability. Any mental condition or frame of mind, organic or functional, arising from physical or endocrine causes may often be the main source of pupil maladjustment.

Bad mental health of the functional type, powerful as a cause in maladjustment, may result from an almost unlimited number of other causes. Excessive worry, abnormal fears, unsocial attitudes, and feelings of inferiority have already been mentioned as causes of poor mental health. The Freudian psychoanalysts stress sex as a basic cause for many types of mental disorder. The rapid pace and the stress of modern life form, without doubt, another potent cause. Also, many cases may result from hereditary causes.

One of the more serious forms of mental illness which is encountered in secondary school, at least in its milder stages, is dementia praecox, or mental deterioration of the adolescent. One authority lists the symptoms of this mental disease as follows :

. . . more or less enfeeblement of the mind . . . emotional indifference, weakness of judgment, flightiness, automatic obedience, . . . impulsive actions, affectations, grimaces, and unemotional laughter, delusions of a depressed or grandiose nature and hallucinations.¹

With regard to the prevalence of mental diseases in one section of the United States, Pollock and Malzberg report :

The data of this study emphasize the seriousness of the problem of mental disease. It appears that approximately 4.5 per cent of the persons born in the state of New York may, under existing conditions, be expected to succumb to mental disease in one form or another, and become patients in hospitals for mental disease. . . . It seems probable that the rate of incidence will not greatly change until the principles of mental hygiene are better known and more widely adopted.²

The accompanying tabulation, drawn from the census records, reveals an alarming increase in the number of hospital cases of mental disease. A change in attitude which favors hospitalization rather than home care accounts for only a portion of this increase. It seems clear that the actual

¹ Archibald Church, M.D., and Frederick Peterson, M.D., *Nervous and Mental Diseases* (1919), p. 811. Courtesy of W. B. Saunders Company.

² Horatio M. Pollock and Benjamin Malzberg, "Expectation of Mental Disease," *Mental Hygiene* (January, 1929), 13: 132-163.

number of cases is increasing. This becomes a real challenge for the school to exert increasing effort to eliminate causes of bad mental health in its own activities and to combat the outside causes.

TABLE 4. MENTAL PATIENTS IN STATE HOSPITALS ¹

Year	Number of Patients	Per Cent Increase over 1904	Year	Number of Patients	Per Cent Increase over 1904
1931 ²	291,077	225.3	1926 ³	246,486	190.7
1930	280,251	216.9	1923	229,664	177.7
1929	272,252	210.7	1922	222,406	172.1
1928	264,511	204.7	1910	159,096	123.1
1927	256,858	198.8	1904	129,222	100.0

The teacher must be alert to this major social problem if he intends to perform a wider duty than that of simply transmitting the social heritage of the race to the adolescent. He must be cautious not to use methods which would accentuate the tendencies toward maladjustment, thereby adding himself to the other causes of the pupil's mental illness. It is his task to apply proper preventives and remedies to the limit of his own knowledge and, where his knowledge ends, to seek aid from more specialized individuals. In so doing he is contributing his part to the pupil's normal mental development and is combating the forces of modern society. These forces now tend to disintegrate the mental powers of the adolescent and thereby to increase the number of cases in hospitals for mental disease.

Just as important an outcome of this action within the school is the ultimate enlightenment of society's attitude toward social maladjustment and crime.

Nevertheless, these strange creatures who have in all times moved mankind to the fiercest anger and deepest repulsion, are defective, diseased, warped and not responsible. . . . Whether it is worth while preserving the lives of such creatures is one question; whether it becomes civilized people to dispatch them out of vengeance and retaliation is quite another. The time seems close at hand when such of them as can be normalized will be put into the hands of competent physicians in hospitals, where they will be prisoners of policy, not of revenge.⁴

From the foregoing analysis of the mental condition of the pupil as a contributory cause of maladjustment the reader should not infer that

¹ "Mental Patients in State Hospitals, 1929-1930," *Bureau of the Census Bulletin*, p. 6. United States Department of Commerce. Government Printing Office, 1933.

² One institution not reporting.

³ Two institutions not reporting.

⁴ Max G. Schlapp and Edward H. Smith, *The New Criminology*, pp. 255-256. Liveright Publishing Corporation, New York, 1928.

the main problem of mental hygiene is that of treating cases already maladjusted. Such an inference would not only be somewhat morbid but would also be untrue. In this, as elsewhere, an ounce of prevention is worth a pound of cure. Proper preventives obviate the necessity of remedies. The positive side of mental hygiene, as described by Burnham in the quotation on page 80, is by far the more important both in the schoolroom and elsewhere, but the corrective must also be present to care for the cases too far along for prevention.¹

4. *Inherited tendencies.* Instinctive tendencies constitute another broad source of a pupil's maladjustment. These tendencies cannot be isolated. They are intermingled with many convergent contributory causes. It is possible, however, to describe the tendencies so that the teacher may keep them in mind as he seeks the underlying causes in any case of improper adjustment.

In general the inherited tendencies or predispositions are of two types. In one type are those largely attributable to one's immediate parentage; in the second type fall those more nearly universal.

Of the first group of inherited tendencies feeble-mindedness and emotional instability are often potent causes of maladjustment. Either may range from a mild form to an extreme form. Pupils with mild cases of mental or emotional inferiority may be able to adjust themselves to normal school life. At a certain point, however, adjustment becomes more difficult, and soon thereafter maladjustment will begin unless the teacher's insight into the case forestalls it.

Among the tendencies considered by many as instinctive the following are of importance to the secondary-school teacher: curiosity, desire for approval, play, construction, acquisitiveness, fear, gregariousness, altruism, self-assertion, pugnacity, and sex. Several of these tendencies form the basis for proper adjustment if permitted normal wholesome expression. On the other hand, their frustration may be the cause of serious maladjustment. For example, when the teacher offers the aggressive pupil the opportunity to exercise his powers for the welfare of the class and the school, the "mastery urge," or self-assertion, becomes the foundation from which real leadership develops; whereas, if the teacher attempts to curb the pupil with pronounced assertive inclinations, he will soon have a rebel on his hands.

5. *Intelligence.* Pupils of extremely high intelligence and those of inferior mental ability may both become maladjusted in part because of this ability or disability. Here again, however, the teacher's actions will determine in large measure the course followed: the normal or a devia-

¹ A serious attempt is made to stress the positive in Percival M. Symonds, *Mental Hygiene of the School Child*. The Macmillan Company, 1934. See also J. E. Wallace Wallin, *Personality Maladjustments and Mental Hygiene*. McGraw-Hill Book Company, Inc., 1925.

tion from the normal. Unless the teacher recognizes superior ability and gives opportunity for exercise and recognition, serious consequences may result. The bright pupil, forced to proceed at a snail's pace, will become irritated and bored and will seek other avenues through which his pent-up mental energy may find release. The dull pupil, if pressed too much to perform tasks beyond his level — a situation to be found quite frequently — will become hopelessly confused. Those with spirit will soon become recalcitrant, while the less spirited may develop a smoldering hatred for the teacher and the school.

The mental ability of the pupil, of whatever level, is intricately associated with all the causes of maladjustment analyzed thus far. The mind's sensitivity is in itself to some degree a determinant of the effect any cause may have upon the individual. Thus the highly alert pupil may sense or even imagine conditions which may lead to unfortunate maladjustment, while the stupid fellow may sometimes be unscathed by the most potent thrust at his imperturbability.

6. *Typical behavior patterns.* Behavior patterns of the pupil as the teacher finds him may be the result of a combination of numerous forces, including among others those discussed under the first five headings of this analysis. These patterns of action have become more or less fixed by continual repetition and will not readily yield to the demands of an environment at variance with them. A conflict between a given pattern and the demands of a new environment may result in poor adjustment until a satisfactory compromise is reached.

Children from rural communities, for example, may have difficulty in becoming adjusted to the large high school in the city to which they have moved. The social conditions in some homes have so fixed certain modes of behavior that the child finds it difficult to adjust himself to the new environment in the secondary school. Habits of study or work, especially the undesirable forms, are sometimes accountable for some of the difficulties in adjustment. Thus any habitual mode of thought or action at variance with those prevailing in the school may become, at least temporarily, the basis for poor adjustment to the school situation.

Perhaps it is well to point out that the school should not always force the child into conformity with its established order. It ought to yield to modes of action which in the long run will be best for the individual and the group. If it is unwilling to do so, then the school itself becomes the cause of a socially undesirable adjustment.

7. *Outlook.* It is possible that the pupil's outlook upon life, his general attitude toward his surroundings, may be classifiable as one of his typical behavior patterns. In any event it is of sufficient importance to warrant separate mention. No matter how favored a pupil may be by intelligence, by home conditions, by emotional stability, by opportunities for

expression and growth, if his outlook causes him not to avail himself of his privileges he will not develop normally. It is likely that some unfortunate experience or chain of experiences may have contributed to his general outlook, that it is not an intrinsic part of his make-up. Consequently the outlook can be altered by skillful suggestion and guidance. Until the unwholesome outlook is properly corrected, it may be a powerful factor in pupil maladjustment.

Methods of Promoting Proper Adjustment

The foregoing analysis of causes of pupil maladjustment suggests at least some of the methods of promoting proper adjustment. In general there are two types of methods which may be applied: the preventive and the remedial.

Means Which Prevent Maladjustment

Complete prevention of maladjustment is a task which the secondary school cannot perform successfully unless the work of the home and of the other social agencies influencing the life of the child, including the elementary school, has been directed toward the same end. Many of the forms of maladjustment will be present when the pupil enters secondary school if the work of the earlier agencies has ignored or unsuccessfully attempted preventive measures. In such cases the secondary school may hope only to check the progress of the behavior deviation, a course which will require both preventive and remedial action. This situation, instead of releasing the secondary-school teacher of responsibility, presents a doubly severe obligation. It requires him to be alert to all possible means of combating maladjustment, both the preventive and the remedial. The preventive will be considered first in the present discussion.

1. *Safeguarding physical health.* It is the teacher's duty to report janitorial deficiencies of the classroom or other portions of the building. For example, if the janitor-engineer should fail to keep the temperature of the room at approximately 68° Fahrenheit, that fact should be reported. Deficiencies in ventilation should be immediately corrected. The seating arrangements for both pupil and teacher should be such that no one faces a strong light. Dust should be eliminated by proper care of floors, walls, and furniture. The building throughout should be kept scrupulously clean.¹

¹ The janitor-engineer staff of the schools of Minneapolis, under the direction of Mr. George Womrath, has become a model for all American schools. Hospital cleanliness is the standard throughout all parts of the buildings, alike in classrooms, toilets, reading rooms, gymnasiums, and lunchrooms.

Overemphasis of perfect attendance records in some schools has endangered the health of the pupils. A child who shows the symptoms of any disease should be sent home and permitted to stay until he is well. In the case of communicable diseases this sane procedure protects the child's classmates as well as himself.

Teachers suffering from tuberculosis have been known to spread the disease to their associates and to their pupils.¹ To say that this is criminal does not describe it too harshly. Ignorance of the condition does not exonerate the teacher. Teachers should voluntarily be examined yearly to protect their own health as well as their pupils' health.

As stated earlier in this chapter, every school child should receive thorough physical examinations at regular intervals. Examinations will isolate the cases which need treatment for any physical defect.

The school has yet another function to perform in protecting the physical health of the school child wherever the problem of community sanitation has not been adequately solved. In such a community it is the school's responsibility to take the initiative in correcting the deficiency. This could be done through assignments which call for a study of the problem and comparison with other communities, through subsequent school exhibits and programs, or through activities of the parent-teacher association.

2. *Safeguarding mental health.* The relationship between body and mind so closely approaches unity that any means of safeguarding one's physical health usually contributes to his mental health as well. The extraction of a decayed tooth which for some time has poisoned one's system and which has recently given one several sleepless nights is a case in point. The correction of eye focus through successfully fitted glasses relieves a chronic headache and releases the mind for normal operation. Extreme exhaustion from physical or mental work reduces one's mental efficiency until the fatigue is neutralized by bodily functions operative during relaxation and sleep. An even more vital relationship of body and mind is revealed in the endocrine irregularities. In the Detroit experiment reported on page 88 the level of the intelligence of some cases was raised with the thyroxin treatment. In general any lack of harmony in the mental processes which might arise from diseased or otherwise defective organic conditions should be prevented by proper physical treatment. This is one of the sanest methods of safeguarding mental health.

But there are forms of poor mental health which cannot be, or at any rate have not yet been, traced to organic or physical causes. Worry, fear, irritation at being frustrated, extreme sensitiveness, paranoiac

¹ F. E. Harrington and J. Arthur Myers, "Tuberculosis as a Teen-Age Problem — the Challenge to Nurses in High Schools and Teacher-Training Schools," *The Trained Nurse and Hospital Review* (April, 1933), Vol. XC.

tendencies, and feelings of inferiority are states of mind more nearly independent of the body than those implied in the preceding paragraph. Any one of them disturbs one's mental balance and if pronounced may become a serious mental disorder. Obviously the first step a teacher should take in preventing maladjustments of this type is to remove all the causes over which he has control. Some children become seriously worried over their schoolwork. The cause may lie in their lack of ability or in their attempt to engage in too many activities. Reduction of load might eliminate the worry, and if so would result in a larger net gain to the pupil because his worry had previously prevented any progress. To direct the less able pupil into activities in which he could succeed would be another method of preventing worry or fear of failure.

The unfortunate consequences of frustration may be prevented by directing the pupil's interests into worth-while activities and permitting him to carry them out. Public opinion to the contrary, the pupil receives as great a thrill from successful performance of worth-while activities as he does from mischief. The theory of repression emphasized the negative by forbidding the child to do certain specified acts. The very demand that he should not do them caused him to want to do them and led to antagonism, combat, and frustration. The new view emphasizes the positive by encouraging wholesome activity. When this succeeds, there is little time for the undesirable. Of the teachers who stress the desirable some are unsuccessful in permitting the pupil to perform the activity without unnecessary interference. To the pupil unnecessary interference by the teacher is as irritating as back-seat driving is to the autoist.

The shy, supersensitive child should be given opportunity to develop social qualities which will prevent his withdrawing tendencies. He should not be subjected to embarrassments either by the teacher or by his classmates. The pupil obsessed with the idea that he is being persecuted by others should be given the opportunity to participate in group activities toward wholesome ends. This form of paranoia may become too deep-seated for the teacher to remove without the aid of a more highly trained mental hygienist, but he may be able to prevent the development of the tendency if he detects it in its earlier stages.

Feelings of inferiority may be combated by permitting the pupil to make a marked success in those things he can do well and by giving him group recognition for his achievements. While this procedure may not entirely remove the feeling, it will certainly prove more beneficial than the traditional procedure of severely reprimanding the child for his failures.

Many schools are realizing that certain long-established educational practices may be unsound from the standpoint of mental hygiene. The

marking system which emphasizes failure, the rigid systems of discipline which terrorize the timid, the highly routinized class schedules which drive the child as though he were a machine, the large-class method of instruction which loses the individual in the mass, and other features of our schools have been subjected to this criticism. The teacher should view his own classes with these weaknesses of the educational machine in mind and lessen the deleterious effects whenever possible.

A school situation conducive to good mental health would include the following elements: a teacher with sound mental and physical health; physically healthy pupils; a neat, comfortable, artistically decorated classroom; a wholesome, cheerful atmosphere resulting from cordial relations between class and teacher; pupil initiative and self-direction in independent work; recognition of achievement; friendly aid when needed but no unnecessary interference; ample opportunity for expression; emphasis of the correct and positive; free intercommunication about the work at hand; well-defined goals of achievement within the ability of the pupil and a well-defined plan for achieving each goal; co-operative endeavor spiced with friendly criticism, — in short, the cordiality which arises from fellowship in learning. In such a school, pupil maladjustment would be rare.

3. *Building social attitudes.* Since many maladjustments result from undesirable social attitudes, a logical method of preventing behavior deviations would be to build the pupil's social attitudes along constructive and desirable lines. A most effective method of developing any attitude is to give it the opportunity for exercise. The desire to co-operate, for example, can be developed best by enabling the pupil to gain the satisfaction which accompanies co-operative activities. Altruism grows as the pupil aids his classmate who has been absent because of illness. Respect for social regulations increases as the pupil participates in the government of the school. Courtesy is better understood as it brings the pupil the respect and admiration of his associates.

By providing the opportunity for these and other desirable social attitudes to find expression the teacher is taking an important step toward prevention of pupil maladjustment.

4. *Gaining the co-operation of the home.* The large majority of homes are not only willing but eager to aid the school in preventing maladjustment. For co-operative effort to be established toward any specific measure such homes need only to be reached by the school or by the teacher. For example, many parents have followed up with alacrity the teacher's suggestion that their children need glasses or that adenoids are interfering with the schoolwork or that certain frames of mind make it difficult for the pupil to make the desired progress. The proportion of homes of this type is much larger than is generally supposed and would

very likely be still larger if the teacher or the school should assume such a favorable attitude to exist and make the suggestions with full assurance that they would be carried out.

Some parents who lack the training essential for a full understanding of many forms of maladjustment are just as willing as the well-informed to co-operate with the teacher or school in correcting any defect or in combating any tendency called to their attention. Only a small percentage of parents are not interested in helping their children in every possible manner. Almost invariably the teacher may expect co-operation when he has clearly and fully explained the problem and has specifically suggested the manner in which the home might co-operate. The co-operation will usually be more prompt and cordial if the teacher has become acquainted with the home while the sky is clear rather than waiting until a difficulty arises.

One must not refuse to face the fact that a few homes are antisocial in their attitude and will not willingly co-operate with the school. The teacher will not be discouraged or resentful at rebuffs from such homes, nor will he consider his duty performed by making a single attempt to secure co-operation. The case will not be ended until a satisfactory adjustment has been consummated either with the eventual co-operation of the home or without it.

In addition to personal visits of the teacher to the homes other available agencies for enlisting the co-operation of homes include parent-teacher organizations, "visit-your-school" campaigns, the local newspapers, the school newspaper, informal social contacts, various types of school programs presented for parents, lay organizations of citizens, and, of chief importance, a school program so worth while that its value will appeal to all. In many cases a combination of these methods and others will be necessary to win complete co-operation of the homes not already willing and eager to co-operate.

5. *Helping the pupil to define his purposes.* The lack of well-defined purposes that invite the release of energy into wholesome channels often results in the expenditure of energy in undesirable ways or in blind acceptance of procedures of no significance to the pupil. Either result is a maladjustment, and both may be avoided, at least in part, by aiding the pupil in defining his purposes. For example, a surprisingly large number of students have only the haziest notion of what the secondary school is attempting to do for them and therefore are unable to attune their ambitions or major purposes to its offerings. To devote some time with the individual or the group to the social aims of the secondary school would lead toward clarification of the pupil's purposes in his schoolwork.

The pupil who apparently has no purposes outside the satisfaction of immediate wants presents an interesting problem. It is possible that he is of inferior mental ability or that he is too busily engaged outside of school

to have energy left for school or that he is completely absorbed in hobbies and other interests not yet tied up with school or that his home conditions preclude the possibility of concentration on school activities. Whatever the cause, he has no apparent purpose in schoolwork. The first step to be taken in such a case is to discover the cause of the pupil's attitude. Clear definition of purpose may be beyond the mental ability of some; a conference with the parents may result in a reduction of the amount of outside activities of others. Still others may be shown that their hobbies may be linked to the subject matter. In extreme cases of unfavorable home conditions perhaps the only procedure would be intervention of a social worker. Removal of those causes for lack of purpose which can be removed will frequently result in growth of purpose after the pupil becomes adjusted to the normal school situation.

The success of this procedure, however, will depend upon the type of school offering. In many secondary schools the regular activities are such that they stimulate purpose and interest. The formalized school, on the other hand, refusing to bend to the needs of the pupil, cannot be expected to stimulate purpose; on the contrary, its offering may be so far from the normal wholesome purposes of the adolescent that the school itself may be the chief cause of the pupil's purposelessness. Obviously the only cure in that case is the complete revision of the offering.

6. *Creating new interests.* Closely related to the foregoing is the problem of creating new interests with a view to preventing maladjustments. In one school the newly elected principal was told that the gang which had forced his predecessor to resign would soon cause trouble. He observed that during the noon hour several of the larger boys loitered about the schoolyard while others remained around the bend of the road, hidden by a steep hill, smoking cigarettes. During the first week of school he called for volunteers to aid him in building an out-of-door basketball court. None of the boys had ever seen a basketball, but soon all were working hard to be on the first team. Later the team itself passed and enforced a nonsmoking rule. In another school a junior-high-school teacher was warned that the Thompson twins were the meanest boys in school. But the two youngsters were merely very bright boys with a healthy flair for mischief when they became bored with procedures designed for the stupid or average. The teacher invited them to help him to correct the arithmetic problems at the blackboard after they had finished their own. They proved excellent assistants and volunteered to help to grade the written work as well. A certain biology teacher had a boy in class who in early spring preferred the woods and streams to the school. At the teacher's invitation the lad immediately agreed to help to make an aquarium and to be the "chief naturalist" for the museum. New and wider interests in natural science followed for the entire class.

Illustrations could be repeated almost indefinitely, all alike in type. In each case the teacher appeals to an unawakened interest of the adolescent¹ or to an interest already known to exist with the pupil, and from that point he builds wholesome abiding interests which will prevent or overcome the maladjustment. In any classroom there is opportunity for numerous worth-while activities of genuine interest to the adolescent, into which his energies may be diverted from maladjustive forms of behavior. Further discussion of this point will be presented in subsequent chapters.

7. *Adjusting the school to pupil potentialities.* "If the mountain will not come to Mahomet, Mahomet will go to the mountain." That was the wisdom of Mahomet, according to story. If the child does not adjust to the school, the school must adjust to the child."² This philosophy of education does not imply that scholarship should be abandoned; rather it maintains that each pupil should have the opportunity to do his best work. The most brilliant should not be retarded by content and method designed for the average; nor should the one least capable of profiting from secondary school be denied the opportunity of achieving all the success of which he is capable. The offering should be adjusted so that the individual pupil may develop to the fullest extent whatever powers he has.

The reader will recall illustrations of exceedingly bright pupils who had become maladjusted, that is, who were not making the progress of which they were capable, largely because they were not expected to do more than was required of the average. No more numerous but perhaps more spectacular were the less capable students who were being forced to accomplish tasks beyond their abilities. Both types of maladjustment are prevented by a wise adjustment of instruction to the pupil's abilities. This principle also is amplified elsewhere in this volume.

8. *Understanding the adolescent.* The best preventive of maladjustment in the secondary school would be the acquisition by all present and prospective teachers of a thorough understanding of the period between childhood and adulthood. Such an understanding would include the physical, mental, and emotional characteristics of individuals during that period, their interests, their personalities, their mental stresses and conflicts, their moral and religious tendencies, and their outlooks upon life. Since the monumental work of Hall³ in 1904 the study of adolescence

¹ The Leisure League of America, Rockefeller Center, New York City, publishes leaflets and bulletins of interest to all teachers in this connection. See also Karl C. Garrison, *The Psychology of Adolescence*, Chapter VII. Prentice-Hall, Inc., 1934.

² From Carleton Washburne, *Adjusting the School to the Child*, p. iv. Copyright, 1932, by World Book Company, Yonkers-on-Hudson, New York.

³ Granville Stanley Hall, *Adolescence: Its Psychology and Its Relations to Physiology, Anthropology, Sociology, Sex, Crime, Religion, and Education*. D. Appleton-Century Company, Inc., 1904.

has been a major problem of educational psychologists. The mass of scientific information on the subject offers the prospective teacher a fascinating field of study and provides the key to the prevention of numerous maladjustments which would otherwise impair the development of the secondary-school pupil.¹

Means of Remedying Maladjustment

Much of the discussion of the preventives of maladjustment applies with equal force to the problem of remedying maladjustment. The first step in any treatment is to isolate and remove the cause. In many cases this prevents further development of the difficulty, thereby relieving the remedial measures of the need for combating the tendencies at their source. Beyond the initial step of removing the cause the remedial treatment consists of a complete analysis of the case and the redirection of the behavior. A somewhat general understanding of the process is afforded in the following discussion of case study, the interview, regulation of environment, redirection of behavior, and humane treatment.

1. *Case study.* The approach of the teacher to the study of any maladjusted pupil should be as scientific as the approach of a highly skilled physician in the treatment of any serious case in his specialized practice. Any display of retaliatory action by the teacher immediately precludes the possibility of proper treatment. Anger or irritation cancels the chances for correct remedial treatment. If any feelings are present, they should be those of helpfulness, of real though not overexpressed and certainly not maudlin sympathy, of curiosity as to the cause, and, if possible, of genuine cheerfulness and optimism.

In this healthful frame of mind the teacher should draw together all available information about the pupil. All items discussed in Chapter III will be of value in understanding the pupil: personal, mental, physical, and scholastic data, as well as aptitudes, interests, past experiences, plans, and personal traits. In addition the teacher should assemble all available information about the particular behavior deviation being studied. This array of facts comprises the case history and either reveals the solution or gives the teacher a foundation upon which to base his remedial suggestions. Quite often the case history reveals the cause for the entire difficulty, the removal or nullification of which may solve the problem, as, for example, a physical handicap which may be corrected by the family physician, or mental ability below that required for the work expected of the pupil —

¹ For content and bibliographies see Karl C. Garrison, *The Psychology of Adolescence*. Prentice-Hall, Inc., 1934. See also Lawrence Augustus Averill, *Adolescence*. Houghton Mifflin Company, 1936.

a condition which can be remedied by reclassification of the pupil or modification of the subject matter. In those cases in which the analysis of the case does not reveal the solution the facts suggest avenues for remedial action. A case in point would be that of the fourteen-year-old girl, mentioned earlier in this chapter, who had all the household responsibilities for a family of five. In that case it was clearly evident that the child should be relieved of some of the burdens, but no immediate remedy could be applied because of the obstinacy of the father. Until a satisfactory arrangement could be made in the home, the child was given opportunity to rest at school and to do only a minimum of schoolwork.

2. *The interview.* Usually the study of a case is not complete until the data collected from other sources have been supplemented by those derived from an informal conference with the pupil. During such an interview the attitudes, emotions, viewpoints, and other characteristics of the pupil will come to the surface and will give a fuller understanding of the problem than would otherwise be possible.

The pupil should not consider the interview a mode of punishment comparable with being "sent to the office." Instead the interview should be with his classroom teacher and should be treated as a time for the pupil to solve a problem with the aid of his teacher. The teacher should have collected all available information in advance and should carry to the interview the same healthful frame of mind which has prevailed in his previous study of the case. Both the teacher and the pupil should be entirely at ease or as nearly so, in the case of the pupil, as is possible under the conditions imposed by the particular behavior deviation. If the two cannot solve the problem satisfactorily, the aid of other pupils, of staff members, of the parents, or of other persons should be sought. The procedure should be devoid of emotion, if possible. It is an occasion for serious discussion of an important problem. Therefore the interview should be deferred until the teacher is certain that a thoroughly rational state of mind can prevail.¹

The interview, if successful, will result in a program, co-operatively drawn up by teacher and pupil, designed to remedy the maladjustment. It is possible that the teacher may reserve additional procedures to be carried out either by the school or by the pupil, one of which is the regulation of the environment.

3. *Regulation of the environment.* The environment which affects the pupil may be regulated or altered only within the limits of the teacher's influence or the school's influence, unless the teacher possesses the power and the determination to extend it further. The following illustrations will deal only with the usual limits of the school's influence.

¹ The student will find suggestions and extended bibliographies on the interview in Walter Van Dyke Bingham and Bruce Victor Moore, *How to Interview*. Harper & Brothers, 1931.

It was discovered in one school that undesirable practices were permitted by the bus-driver. His removal proved the best method of controlling the situation. Poor progress in school often results from unsuitable study conditions in the home and leads to maladjustments more undesirable than the poor progress itself. A discussion with the parents will frequently correct the difficulty. When they are unable to provide opportunity for home study, a satisfactory remedy would be to extend opportunities for study at school.

In another school it was discovered that an indecent and immoral pupil was polluting the entire group. The best solution seemed to be to remove the offender to an institution for special supervision. When there is a possibility for such serious offenders to be cared for within the school and when such a course would not impair the welfare of the group, it is better not to incarcerate them in the semipenal institutions; but when they are apparently incorrigible, they should not be permitted to injure the group by their presence.

The particular practice in the regulation of the environment will obviously be suggested by the condition calling for regulation. As a general policy regulation of environment is less desirable than that of positive training which will enable the pupil himself to be wholesome in his actions regardless of his environment. These two general policies are constantly in conflict in adult society and should be used together in proper balance in the school.

4. *Redirection of behavior.* The outcome of the interview will frequently be a redirection of behavior, sometimes consciously carried out by the pupil, at other times directed by the teacher with the pupil more or less unaware of the change.

The morale of one small-town school was being somewhat disturbed by a secret society, "The Secret Seven." Later, not to be outdone, another group formed "The Nasty Nine" with entrance qualifications rather numerous and entirely in accord with the name of the order. Two actions were taken by the superintendent. He discussed the problem with a group of businessmen, and they agreed to supply complete football equipment for the boys in order to start a program of athletics in the school. The leaders of the two secret orders became the best players on the team and were the most severe of all in the punishment meted out to any boy who broke the training rules imposed by the squad. The second step taken by the superintendent was the formation of a Hi-Y group in the school, which, though a less spectacular success, diverted the activities of the boys into wholesome channels.

In a Chicago high school the cafeteria-manager, by having groups of ten act as luncheon parties with pupils taking turns as host or hostess, checked the disorder which previously had resulted in broken chairs and dishes.

There is no procedure more sound in theory or more successful in practice than that of redirection of the behavior of pupils who have become maladjusted.

5. *Humane treatment.* Kindness should prevail throughout the treatment of any problem case. The teacher is in no sense an avenger who must punish the offender. There is no place for punishment of any sort in the schools of an enlightened people. That inhumane treatment of offenders persists in adult society is not sufficient reason for it to enter the school. The school must use the more rational and scientific method of treating the maladjusted pupil as a patient and must give the patient a treatment as humane as that which the most progressive physician demands for his patient.

Outcomes of Pupil Adjustment

For the pupil proper adjustment results in normal wholesome development of all his abilities. Correction of physical defects gives him an equality of opportunity he would not have otherwise. Adjustment of the school offering to his ability adds zest to school life whether his ability be high or low, because it permits him to achieve to the limit of his capacity. When the adjustment is made on that basis, average scholastic achievement should increase; the bright will not be bored by being forced to wait until the less able have mastered the content, and the inferior students will not become discouraged at trying to attain a pace beyond their rate of learning. With the mental maladjustments corrected the pupil will be free to develop normally, unshackled by the inhibitions and stresses of poor mental health. In short, proper adjustment results in a fully developed, well-rounded personality.

From a wider viewpoint proper pupil adjustment ensures society against maladjusted adults — physical, mental, and emotional. If the schools should for a generation adequately solve the problem of pupil adjustment in all its aspects, society would be saved many times the expense in terms of decreased numbers of delinquent, physically handicapped, and mentally diseased. On the positive side, there is every reason to expect that social progress would be enhanced by the contributions of the increased number of normal healthy-minded individuals.

The teacher with the viewpoint expressed in this chapter feels that he is more than a transmitter of the social heritage carried in the subjects of instruction. He feels himself a part of a great social force, the school, which by enriching the lives and liberating the minds of each generation will gradually help to build a better civilization.

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CHAPTER V · Stimulating Secondary School Pupils to Wholesome Activity

GENERAL VIEW OF THE CHAPTER

Purpose of the Chapter

The Primary Sources of Human Activity

The Secondary Sources of Human Activity

Classroom Significance of Certain Primary and Secondary Sources of Motives

Typical Interests of Adolescents

Typical Drives of Adolescents

The sensory-motor urge

Secondary sex tendencies

Self-assertiveness, or mastery

Rivalry

Imitation

Gregariousness

Social approval or disapproval

Altruism

Constructiveness

Collection

Curiosity

Attitudes

Ideals

Traditions

Information

Habits

Interests

Varying Degrees of Drive

The Use of Interest Rather than Artificial Compulsion

The Creation of New Interests

Combating the Less Desirable Interests and Attractions

Methods of Stimulating Wholesome Activity

Make the work of the school worth while

Convince the pupil that the work is worth while

Provide conditions conducive to learning

Help the pupil to define his purposes

Make clear-cut, definite assignments

Help the pupil to keep his bearings

Appeal to the basic sources of action

Illustrative Devices and Techniques

Selected References for Further Study

Purpose of the Chapter

THE preceding chapters have dealt with four general fields of information of which the prospective teacher should be conscious as he enters his study of secondary-school teaching. Chapter I outlined the various aspects of the teacher's work in the forms of problems, desirable traits, and ethical principles of the profession. It was followed by a discussion of the objectives of secondary education and the relation of the teacher's work to those objectives. Chapter III stressed the importance of knowing the pupil as an individual in order to facilitate his development. The closely related problem of pupil adjustment was next treated.

The present chapter introduces the major problem of stimulating pupils to wholesome activity. Assuming that the teacher knows the pupil as an individual and that the pupil is well adjusted physically and mentally, we consider next the question of directing his energies into worthwhile channels and arousing in him new drives toward desirable goals.

Many difficulties which arise in the typical classroom are the result of the teacher's inability to motivate the class. In the absence of interesting things to do which are related to the school activities the pupil will seek relief from boredom in inventions of his own. At this point the difficulty begins. A knowledge of the interests, drives, and activities of the adolescent is a prerequisite to the ability to direct his classroom and extra-curricular work with a minimum of friction and lost motion. This knowledge carries deeper meaning when it is preceded by an understanding of the basic sources of human activity. It is the purpose of the present discussion to open this field of study and to present certain principles and devices of value in stimulating wholesome activity in the secondary school.

The Primary Sources of Human Activity

The main sources of human activity, or the basic causes for human behavior, have been divided in this chapter into the primary and secondary for convenience in discussion. It should be clear to the reader, however, that the two categories have not been differentiated with scientific accuracy. Studies of the source of human motives have led to conflicting conclusions. The physiologists in their explanation of why the human being behaves as he does are inclined to attribute much to the physical and chemical processes of the body. At the other extreme the idealists and the theologians look to what they consider loftier causes for

conduct. Between the two extremes come the psychologists, who themselves have varying viewpoints, from the physiological-psychologist, who because of the kind of knowledge he possesses stresses the physical, to the social psychologist, who for like cause stresses the ideational. At the present stage of knowledge it is not possible to list in separate categories, without the possibility of contradiction, the conduct tendencies of the individual which are present at birth and those which are acquired through contact with the environment. Nor is it possible to say with certainty which are the more powerful factors in human behavior, those which are inherited or those which result from experience.

One writer expounds at length the doctrine that "all behavior goes off, in the last analysis, by virtue only of certain final physiological quiescences, which are being sought, or of certain final physiological disturbances which are being avoided."¹ He lists six appetites and two aversions as the "ultimate drives" to which "all the various specifications and elaborations of motivation" may be traced. The six appetites, according to Tolman, are food hunger, sex hunger, excretion hungers, specific contact hungers, rest hunger, and sensory-motor hungers. Behavior arises from each when its characteristic type of physiological disequilibrium occurs, as, for example, the quest for food when cravings for hunger satiation accompany undersupply of food in the digestive tract. The two aversions, according to this writer, are fright and pugnacity. The appetites induce behavior toward that which will result in satiation and the subsequent physiological quiescence, while the aversions induce behavior intended to avoid causes of physiological disturbances, according to Tolman's doctrine.

McDougall² presents a longer list of "instincts" and links each with its predominant emotion, as follows:

<i>Instinct</i>	<i>Emotion</i>
Flight or concealment	Fear
Repulsion	Disgust
Curiosity	Wonder
Pugnacity	Anger
Self-abasement	Subjection
Self-assertion	Elation
Parental instinct	The tender emotion

¹ Edward Chace Tolman, *Purposive Behavior in Animals and Men*, p. 271. D. Appleton-Century Company, Inc., 1932.

² William McDougall, *An Introduction to Social Psychology*, Chapters III-IV. 1921. By permission of John W. Luce & Company, Boston, and Methuen & Co., Ltd., London.

Other instincts included in McDougall's analysis are the instinct of reproduction, the gregarious instinct, the instinct of acquisition, the instinct of construction, and the general or "non-specific" innate tendencies of sympathy, suggestibility, imitation, and play. Allport¹ is more critical than McDougall in his definition of instinctive tendencies, and names only six "fundamental activities": starting and withdrawing, rejecting, struggling, hunger reactions, sensitive-zone reactions, and sex reactions.

The several categories of instinctive human tendencies given above illustrate the conflicting views of students of human motives who approach the problem with different methods and from different backgrounds of temperament, knowledge, and experience. The lists also serve the more valuable purpose of supplying outlines of the raw material with which the teacher must work. Inasmuch as some of the more basic sources of motives enter the classroom through their derivatives rather than in their raw form, the secondary sources of activity, derived from these deeper springs of human action, are of more immediate significance to the teacher. There are fewer conflicting views with respect to the existence of these characteristics. Furthermore, they are to be found in almost every normal social situation.

The Secondary Sources of Human Activity

In general it may be said that the primary sources of human activity are to be found in the biological processes, those somatic functions which maintain the life of the individual and the race. It is not possible to set the point at which these processes leave off and the mental processes begin. The two types of processes are too closely interdependent for a clear-cut differentiation to be made. Several illustrations will make this point quite clear: Intense hunger or severe pain is likely to dampen the ardor of the average person for a concert or a masterpiece of art; sudden fright or imminent danger will quickly detract from any learning process in which one might be engaged; or, as has been stated in an earlier chapter, certain endocrine irregularities or diseases are powerful determinants of mental disabilities.

For the practical purposes of this discussion, however, and with proper recognition of their ultimate dependence upon the body, it may be said that the secondary sources of activity are more closely related to conscious mental processes than the primary sources.

¹ Floyd Henry Allport, *Social Psychology*, Chapter III. Houghton Mifflin Company, 1924.

Among the more important of the sources which in this discussion are called secondary are those general human traits, some of which have been listed by earlier writers as instinctive, including altruism, or feelings of sympathy for others; the desire to construct; curiosity; gregariousness; imitation; the desire to master; the desire to play; pride in achievement; rivalry; the desire for social approval; the fear of social disapproval; and the tendency to submit to others. These characteristics are powerful determiners of action and as such are forces which may be used in the classroom in stimulating desirable pupil activity.

Somewhat different from the foregoing secondary sources of action are one's attitudes. A knowledge of an individual's attitudes enables one to predict his actions under given circumstances. Under those circumstances the attitudes become sources of action. Closely related to attitudes, yet different from them, are ideals, which at times are the most powerful determiners of action, overcoming the more basic drives, as, for example, a person's willingness to die for a cause or to endure severe privation to keep his self-respect. Another source of action which belongs in this group consists of traditions. These social inheritances may include lore of family, race, nation, or institution and often give power to ideals and attitudes as determiners of action. Since the intensity and power of the actions which arise from these general sources vary greatly with circumstances, much care and tact should be exerted in their use. Thus, while it would be quite safe to use them in normal times, it would be unwise to do so when they are involved in community controversies, as, for example, during heated political campaigns.

The opinions which one holds, even before they take on the tones of feeling and crystallize into attitudes or prejudices, may likewise be sources of action. Sheer information also is often a determiner of action, especially in a problem situation, as, for example, when a compass is used in the northern woods to determine the direction of one's destination.

Another very potent cause of action may be found in one's habits. As they become more deeply ingrained, they consume more and more of the individual's time and energy and determine a greater proportion of his actions. This is true of both types of habit: physical and mental. Finally, one's interests constitute a very important source of activity. Their pursuit is a definite and direct occasion for activity. Furthermore, the possibility of linking other activities with them makes them doubly important as a source of action.

Classroom Significance of Certain Primary and Secondary Sources of Motives

The crux of the teacher's problem of stimulating secondary pupils to wholesome activity is his ability to relate activities in the classroom to the primary or secondary sources of motives. All rational human activity, as well as much of the irrational, arises from some basic motive. Various experiments have shown the power of motives in stimulating pupil activity and the possibility of linking the basic sources of action with classroom work.¹

For example, a superior teacher will not set up rigid rules of behavior intended to curb the "sensory-motor hungers," the basic urge to activity which seeks to release normal energy. Instead he will enlist that basic drive as an ally. He will permit freedom of action in the use of whatever materials of instruction there may be in the classroom or the library. He will permit students to construct illustrative materials such as models, maps, and booklets, which in addition to giving satisfaction sheerly from the physical activity involved may be made highly instructive. Field trips, demonstrations, dramatizations, reports, and group conferences further illustrate educational procedures by which the teacher may give release to the urge for activity. Such activities do more than satisfy this basic hunger; they also lend a pleasantness to the learning situation which in itself, other things being equal, makes for better learning.

The teacher who, several days before the class was to begin a study of Russia, filled the classroom bulletin board with pictures and clippings dealing with that country was appealing to at least one basic source of interest: curiosity. Whether on the athletic field or in a classroom discussion the urge for self-assertion is released and should be encouraged. These human traits and others, rejected from the classroom in earlier times as agents of evil, prove highly constructive and valuable forces when directed into proper channels.

The desire for social approval stimulates activity toward those things which are exalted by the group, whether they be the head-hunting of primitive tribes or the public service of a community-fund drive. The individual will seek the prestige of group approval by performing those activities which are necessary for the attainment of that approval. The

¹ For a summary of experiments in this field see Walter S. Monroe and Max D. Engelhart, "Stimulating Learning Activity," *Bureau of Educational Research Bulletin No. 51*, p. 48. University of Illinois, 1930.

teacher's problem in this regard is that of helping to determine the approved ends. This point was illustrated by a remark made by a high-school senior: "Gee, when I was in — High, I never paid much attention to my studies. All they thought about over there was football. But when we moved over to —, I soon found out that studies came first. Then I got a kick out of making good grades." This illustration does not mean to disparage either type of activity, — football or studies, — but merely to show the power of social approval as an incentive.

The devices discussed later in this chapter further emphasize the use of natural motives. Small wonder that the teacher fails who either ignores these forces or attempts to curb and thwart them. Success in teaching depends upon knowledge of these innate urges and skill in directing their potent powers into constructive channels.

Typical Interests of Adolescents

As stated above, one of the chief sources of the adolescent's activity consists in the interests which he already possesses. A number of studies have revealed wide ranges of interests to which the secondary-school teacher may appeal. For example, Lehman¹ found the following play activities, among others, being engaged in by more than 25 per cent of girls of secondary-school age: going to the movies, going to parties and picnics, visiting or entertaining company, looking at the Sunday "funny paper," reading the newspapers, reading short stories and books, painting with water colors, hiking, playing basketball, playing card games, running and romping, telling riddles, dancing, social-club activities, and driving an automobile. He found the following among the activities engaged in by more than 25 per cent of the boys of the same age: playing baseball, watching athletic sports, listening to the phonograph or radio, looking at the "funny paper," reading newspapers, reading books and short stories, whistling, playing football, shooting a gun, telling stories, making or using a wireless set, dancing, and social-club activities.

Other types of interests which are typical of adolescents include the formation of groups or gangs with similar interests, seeking and developing close friendships with persons of similar interests, participating in organized group and social activities, and the widening of horizons through music, art, and literature.

¹ H. C. Lehman, "The Play Activities of Persons of Different Ages," *Pedagogical Seminary* (June, 1926), 33: 250-292.

Just as important as a knowledge of the adolescent's general interests is a knowledge of the individual's specific interests. Through a check list of interests, such as the one suggested in Chapter III, a teacher is able to identify the interests of each pupil. When these interests are linked to the content of the secondary-school curriculum, they prove powerful motivating forces. Thus the pupil with a keen interest in radio, if given the opportunity, will carry the physics class farther into that field than they would otherwise go. The pupil with a flair for cartooning will provide the history class with illustrative material if the teacher knows of that interest and encourages its development. The stamp-collector will enliven the history-class discussion in a unique manner with descriptions of stamps of the country being studied. The pupil interested in writing poetry will, if encouraged, provide poems for special occasions. And so at length one might cite examples of the proper recognition of special interests by the teachers in conducting any school activity. The procedure consists of discovering the interests which pupils have, of providing opportunities in connection with school activities for the pursuit of those interests, and, by recognizing the abilities involved, of encouraging the students to avail themselves of the opportunities.

Typical Drives of Adolescents

The typical drives of the adolescent may be grouped around the primary and secondary sources of motive. They are the urges to action, the pent-up streams of energy which seek outlets. The teacher should be aware of them and give opportunity for free play of the drives along wholesome avenues. Some possible outlets of this driving power are suggested in the following paragraphs. It should be understood that in many cases several sources of motives combine their power toward a given outlet, as, for example, when the sensory-motor urge, the urge to mastery, the urge toward social approval, and perhaps other basic drives combine in the supreme efforts on the football field or the basketball court. However, it is of value to list the drives and to enumerate some of the activities through which they frequently find release for their energy.

The Sensory-Motor Urge

It is not possible to isolate the activities of adolescents which result solely from the sensory-motor urge, or the urge to release pent-up energy.

On the one hand, any one of several different drives, in addition to the sensory-motor urge, operating singly may produce physical activity of some sort; on the other hand, any given activity may be the result of a combination of drives operating together. In any event the sensory-motor urge plays an important part in the life of the child and the adolescent.

Physiologists have found that the amount of heat, or energy, per square meter of body surface is greatest at the age of one year, that the decline in this ratio is rapid until the age of eight or nine is reached; but that at the age of twelve or thirteen, although the ratio is still declining, the amount of heat per unit of body surface is twice that produced by the adult. With respect to the difference in the amount of energy produced by the two sexes, Benedict states:

Finally, referring to the analysis of the heat production per square meter of body-surface with increasing weights, we note in Figure 29 that up to 8 kilograms (average age: less than one year) no differences in the sexes are to be noted, but thereafter the boys have a somewhat higher heat production on the whole, thus indicating a specifically somewhat higher metabolism with the growing boy than with the growing girl.¹

This suggests that much of the physical activity of the child and of the adolescent may be simply the flow of excess energy. The restless wriggling at the desk, the aimless movements of hands and shifting of feet, the monkeyshines while passing through the halls, the random actions in the library or study hall, the explosion into freedom from the door of the formalized school at the end of the day, the aimless pranks and the ceaseless running and playing in the gymnasium or on the playground, — these and the countless other movements of the wide-awake adolescent all attest to the fact that the energy which is generated by the rapid metabolism characteristic of childhood and adolescence must find release in bodily action. This drive must be taken into consideration in all classroom practice. To ignore it or, worse yet, to suppress it would be like plugging up the spout and tying down the lid of a full teakettle on a hot stove. In both cases, by virtue of natural law, an explosion would soon occur. Sufficient freedom of action to release the surplus energy of the adolescent is essential in classroom practice if he is to gain normal development.

¹ Francis G. Benedict, "Energy Requirements of Children from Birth to Puberty," *The Boston Medical and Surgical Journal* (July 31, 1919), Vol. 181, No. 5, pp. 107-139.

Secondary Sex Tendencies

It is often asserted that with maturity of reproductive powers come certain tendencies referred to as secondary sex tendencies. Whether all such tendencies may be traced to primary sex hunger is a debatable point, but it is true that they are rather generally observable in adolescents. Whatever the basic cause for his action may be, the boy at a certain age pays more attention than formerly to his dress and personal appearance, seeks companionship with girls of his age, and refuses to tolerate treatment designed for younger children. Similarly the girl seeks to attract and develops more mature outlooks.

There is little scientific proof in support of the view that numerous activities of the adolescent can be traced to the fact of the ripened sex function. Nor is it sound to say that these secondary sex traits develop suddenly at puberty. Many of the traits frequently listed in categories of adolescent traits are observable in preadolescents. A case in point is pairing off of "girl friends" and "boy friends" observed in a second grade, in which all the wiles of the more deadly of the species were much in evidence along with the jealous rage of the male.

Until scientific evidence is at hand, much of the speculative writing on this problem should be read with mental reservations. Yet the observable tendencies, regardless of source, may be directed into wholesome channels by the teacher and be used in stimulating desirable classroom activities.

Self-assertiveness, or Mastery

Conflicts on the debating platform or on the athletic field, difficulties between teacher and pupil, and scholarship contests are among the activities which often rest in part upon the self-assertive tendency. Though not in any sense limited to the secondary-school period, this powerful motive force may be observed in adolescents and should be encouraged in classroom practice. Incidentally the teacher should not himself be so obsessed with the will to power that he thwarts it in his pupils. Their normal development depends in part upon its proper functioning.

Rivalry

The drive which springs from rivalry, like that from self-assertiveness, if indeed they may be separated, results in competitive effort in studies, extra-curricular activities, and some types of physical education, espe-

cially intramural and interscholastic athletics. Both individual competition and group competition are powerful incentives toward whatever activities are essential to winning. Self-competition, or attempting to excel one's own record, is a somewhat modified aspect of rivalry and an excellent type of school activity.

Imitation

The tendency to follow the example of others, which is strikingly apparent in adolescents, gives great significance to the actions of teachers and older persons with whom the pupil has contacts. The game "Follow the Leader" typifies this tendency. The child performs numerous acts solely because he has seen some older person perform them, usually, although not always, someone whom he admires. The popular actor or actress, the all-America football player, the hero or heroine of a book, an outstanding local citizen, often the teacher, the older boys and girls who are school leaders, even the circus performers, and all others in life, history, or literature who impress the pupil are mimicked in varying degrees. The resulting activities yield satisfaction because for the instant the pupil becomes the person imitated. The drive associated with this tendency becomes a valuable asset in pupil development when recognized and used by the teacher.

Gregariousness

The urge to associate with persons of one's own kind forms the basis for adolescent gangs and clubs of all types, desirable or undesirable. Many of the recreational, character-formation, and extra-curricular activities illustrate proper direction of this tendency. Within the classroom, group work on reports, problems, and projects is founded in part upon the gang instinct. Schools which ignore this drive find themselves faced with groups which have less desirable purposes, such as certain secret societies, sand-lot groups, and embryonic Dillinger gangs. The drive will find expression; it should be directed into socially desirable avenues.

Social Approval or Disapproval

Associated with other drives is the powerful desire to receive the approval of the group. Some of the school activities for which this tendency is in part responsible are efforts to keep in style in dress and speech, the unwillingness to tattle, the exertion to win awards which carry prestige, and personal sacrifice for the benefit of the group. Here, as in almost every other instance, the activity cannot be traced solely to one drive.

Each drive, however, contributes its part to the ultimate action of the individual in these activities as in others.

Altruism

A sincere, unselfish interest in the welfare of others may be at the bottom of such activities as aiding a fellow student who is slow in his work, contributing to the lunch fund for needy students (although this problem should be solved in other ways), formation of social-service clubs and activity in them, acting upon a committee to visit an ill classmate, responding appreciatively to heroic acts of human service recorded in history and literature, and acting with courtesy and kindness in contacts with associates. This fundamental social trait of altruism is considered by some sociologists as the foundation upon which the solution of the major problems of society will be based. If this conjecture in any small degree approaches truth, certainly the secondary-school teacher should give this tendency conscious encouragement.

Constructiveness

The desire to build or to design finds release in industrial arts, in designing, in painting, in such extra-curricular activities as constructing a stage or establishing a museum, or in classroom projects calling for models, diagrams, charts, or portfolios of work. Activity directed toward a well-conceived product seems to add satisfaction to the sheer expenditure of energy. It may be that the satisfaction is associated with the anticipated returns from the product rather than solely with the process of building. In any event the desire toward constructive work is present and forms a sound basis for desirable activity of the secondary-school pupil.

Collection

The urge to collect develops almost to the stage of a mania with some adolescents and preadolescents. Cigar bands, match pads, stamps, knives, pictures, rocks, birds' eggs, butterflies, beetles, woods, labels, coins, and a hundred other objects fall prey to the restless activity of the collector. Many of these drives follow through and become lifelong hobbies or even vocations. They absorb energy which might be expended in worse ways, provide amusement, afford enrichment material for class and extra-curricular activities, and often supply the common ground for the development of friendships. Many a school museum and much illustrative material have resulted from this drive when encouraged and directed by the teacher.

Curiosity

A general-science class was opened by having one of the girls place her left index finger in a glass of ice water and her right in hot water for a few seconds, then both in a glass of lukewarm water. The curiosity of the class was aroused first by the unusual procedure, then by the teacher's question as to the cause for the different sensations from the two fingers. This procedure motivated a live discussion of the thermometer.

The tension which is aroused by anything which challenges one's curiosity produces a drive toward active inquiry to solve the mystery. The solution releases the tension, and the pupil is then satisfied. This almost universal drive, innate curiosity, is a sure source of desirable activity. Once keenly aroused, it grows until it is satisfied.

Attitudes

The typical reaction which arises from a deep-seated opinion or prejudice constitutes a potentiality which is transformed into drive whenever its specific stimulus is applied. Some reactions of this type are as explosive as powder touched by a spark, as, for example, racial or sectional or partisan attitudes in times of excitement. Clashes of attitudes in adolescents often result in irrational conflict. They may, however, be harnessed and used toward productive ends in wholesome contests or in enterprises of individuals seeking to justify a good cause toward which they have a favorable attitude.

Ideals

A pupil's concept of right and wrong, his standards of life, his ambitions, his religious beliefs, — in short, all his ideals, — are, on the one hand, definite drives toward proper action and, on the other, powers which inhibit improper action. They account for much of his activity and are in a real sense allies of the school so long as it is in accord with high standards. If the teacher is unfair or otherwise out of harmony with ethical practices, the ideals of his pupils cease to be allies, a situation not rarely resulting from the pupil's misunderstanding of the teacher's motives and sometimes resulting from the teacher's actual misdeeds.

It is obvious that the development of the ideals of the pupils through encouragement and exercise is a major function of the teacher. Thus, while using the drive which accompanies ideals as a motive power for school activities, the teacher likewise serves the direct purpose of strengthening the ideals.

Traditions

Traditions may be handed down in the form of racial or national attitudes, or ideals, or anecdotes, or bare information. In any case they carry potential power which is transformed into activity when proper occasion arises. The pride which accompanies a tradition gives zeal to any activity which may arise from it.

In one school a Negro boy recently from Alabama immediately attracted favorable attention with his enthusiastic description of his homeland when called upon to tell to the group some of his earlier experiences. Likewise, during a lesson which dealt with the services of Kosciusko in the American Revolution a child from Poland thrilled his classmates with stories of Polish heroes.

Traditions of race, nation, section, state, community, or family, when called into play by the teacher who knows the pupil's background, give rise to highly desirable educational activities.

Information

Less charged with feeling than attitudes, ideals, and traditions, bare information may nevertheless sometimes be the chief determiner of activity. True, it more nearly plays the part of a torch than that of a pent-up force; it lights the way by providing proper procedure in a problem situation. At a given point it is bare information that determines which route the activity will follow.

In another sense, information adds to the driving force of a pupil's enthusiasm or an adult's. Cases in point are further information as one nears the solution of a problem or a mystery or new facts about a cherished author, work of art, or musical composition. Thus, while not usually considered in itself a source of motive, information may rightly be placed in such a category.

Habits

The actions which have become more or less automatized through constant practice produce a kind of mental, emotional, or physical momentum which carries the individual into satisfying repetitions of the activities associated with the habit, when the opportunity arises. This applies to study habits; reading habits; work habits; recreational habits; habits of etiquette; personal habits of sex, dress, and hygiene; habits of speech, — in fact, to every conceivable type of habit, good and bad. In time, one's life runs along safely in the ruts of his habits; for

almost every situation which might arise one has a predetermined reaction. While this is not so true of the secondary-school pupil as of the adult, nevertheless each habit which the pupil has developed is a source of motive power toward a given reaction whenever a specific occasion arises, and thus accounts for many of his activities.

Incidental to the present discussion is the fact that the teacher is confronted with the bad habit, whether it be of speech, of study, of hygiene, of play, or of what not. It is not possible to plan work which will use all the drives of habit, because some of them would lead in the wrong direction. It is more difficult to redirect the action of a tendency already established than to give direction to a force not yet started; it is more difficult to change the direction of an automobile moving in a deep rut than it is to start one in any desired direction from a parking space on a smooth surface. Thus the teacher's use of the drive behind some habits differs from his use of such a drive as that behind curiosity or the desire to build. With desirable habits the case is similar to that of other desirable drives; their power may be taken into consideration in planning classroom activities.

Interests

Associated with each of the interests listed under the earlier discussion of adolescent interests is the drive which produces activity. These drives are among the most important in the adolescent's life. Their compelling force accounts for much of his activity. They may be either directed into broader streams of action or associated with related interests. In both cases they bring enrichment to the pupil's life.

Varying Degrees of Drive

In each of the seventeen illustrations of drive outlined above, the force of the drive may vary greatly in different persons in a group, and likewise it may vary greatly at different times in the same person. Consequently the same procedure by the teacher will produce different results within a given group or at different times from any given individual. What may at one time bring about the desired response may at another time fail to create any activity.

In attempting to take drive or interest into consideration in any planned procedure this fact of varying degree should be kept in mind. The individual should be studied for the kind and amount of drive he

possesses; this is the first step. Following that, one should consider the range of any given drive present within the given individual at different times.

The Use of Interest Rather than Artificial Compulsion

Is it possible for a teacher to stimulate activity by relying solely upon the interests which are associated with natural drives, or should he use artificial compulsion? It is true that sometimes artificial compulsion results in the formation of an interest which will continue without outside influence. But it is also true that sometimes lasting distaste for a field results from compulsory measures. Consequently, if such devices are to be used at all, the student's reaction should be studied carefully and the measure dropped if its results are harmful. Such extreme usages as corporal punishment for work not completed certainly have no place in a modern school.

Under ideal conditions, where the home environment is good, the school atmosphere conducive to good work, and the pupil's attitude favorable, the teacher may rely entirely upon the normal reactions of the pupil in directing his work. Under less desirable conditions there is still much doubt whether the pupil, in the long run, will profit more from compulsory measures than he will by being permitted to go at a slower pace until his interests grow sufficiently to motivate his activities. Usually the sounder procedure is to begin with whatever interest or drive the pupil may have and to build slowly from that point rather than to force him into activities in which he has no interest. Information gained from the latter method will rarely have any significance to the pupil, whereas by the slower procedure the little that he does acquire will have meaning and will gradually grow into a compelling drive.

Under the existing system of marks and promotion the teacher may find difficulty in using inner drives as the sole basis for stimulating activity. But there are hopeful signs of changes in the present system from drilling processes, which emphasize the acquisition of information, toward educative processes, which help the pupil to use information in the development of his abilities and interests. The teacher has the opportunity to increase the rate of those desirable changes by emphasizing in his teaching the use of the normal drives and by discarding artificial compulsion from his classroom practices.

The Creation of New Interests

The basis for the stimulation of activity may be widened constantly by the creation of new interests. As the pupil becomes interested in more different things, the teacher has the opportunity to direct his activities from a wider range of starting points. From this standpoint alone it is advantageous to increase the number of interests the pupil has.

The interests a pupil has already formed may in themselves be widened, as, for example, interest in biography has almost limitless possibilities. Again, one interest may lead to another closely related. An illustration of this would be one kind of collecting becoming linked with another, such as stamp-collecting with coin-collecting, or interest in economics developing from a course in sociology. In one instance a study of the foreign-debt situation was stimulated by a teacher through an account of the American Legion's rather dramatic refusal to consider Paris as a meeting place for an annual convention. Current topics of local, national, or international significance often may provide the starting point for a new interest. Thus on one occasion a Thanksgiving community pageant caused an eighth grade to make an intensive study of the history of its community. By seeing such opportunities and using them the teacher is able to keep the pupil at a high pitch of interest. This is equally true when an old interest is broadened or when it is used as the basis for a new interest. In all cases such practice is advantageous to both pupil and teacher. It develops the pupil in desirable ways, and by keeping the pupil happily engaged it prevents many unpleasant occurrences which might otherwise take place, thus conserving the teacher's nervous energy for constructive work.

Combating the Less Desirable Interests and Attractions

The problem of stimulating wholesome activity is often made more difficult by the presence of undesirable interests and conflicting attractions. When the interest comes from some pernicious habit, deeply embedded, it may be beyond the power of the school or any other agency to overcome the tendency. In such a case, if the individual is a menace to the school, he should be placed under proper care in another type of institution. Luckily such cases are very rare.

Milder cases arise from association with questionable groups outside of school, from bad reading interests, from various practices connected with loafing in school and outside, and from other similar influences.

Commercialized attractions, such as public dance halls, amusement halls of other types, and the movies, have a powerful appeal, quite often legitimate to some degree but a menace to constructive school activities if patronized too extensively.

A sound yet often difficult method of combating either an undesirable interest or a distracting outside influence is that of substitution. If the teacher, for example, is able to awaken a keen interest in such reading materials as *Treasure Island* or good historical fiction, materials of lower quality will soon cease to attract. Extra-curricular activities of numerous types, where well planned, have proved successful competitors against attractions of low order.

In almost every school this problem must be faced; its solution lies in making the offering of the school more attractive and interesting than that of the outside influences. Such a solution has been found feasible in numerous school systems. It is not visionary but is practical and certainly important in every successful school program.

Methods of Stimulating Wholesome Activity

Thus far in this chapter consideration has been given to the primary and secondary sources of activity and their classroom significance, to typical interests and drives of secondary-school pupils and their varying degrees of intensity, to the use of inner motives instead of imposed measures, to the creation of new interests, and to the need for combating undesirable interests. Having these points in mind, the student may well ask, "By what general methods is one to use this information in stimulating wholesome activity on the part of the pupil?" The answer to this question will be presented in seven parts:

1. Make the work of the school worth while.
2. Convince the pupil that the work is worth while.
3. Provide conditions conducive to learning.
4. Help the pupil to define his purposes.
5. Make clear-cut, definite assignments.
6. Help the pupil to keep his bearings.
7. Appeal to the basic sources of action.

Make the Work of the School Worth While

There is no doubt that the schools have made great strides since 1910 in increasing the value of their offering. In one group of thirty-five schools, studied for 1906-1910 and again for 1929-1930, it was found

that the number of courses offered had increased 500 per cent.¹ An analysis of the new courses reveals increased emphasis upon such topics as "problems of democracy, social problems, international relations." Enrichments occurred also in "English, fine arts, industrial arts, home economics, and commerce." The following quotation from the same study indicates the trend toward what is now considered more worthwhile content :

The great popularization of the senior high school in recent years has been accompanied by a shift from the traditional college-preparatory and disciplinary aims to those embodied in the "cardinal principles," namely, citizenship, health, command of fundamental processes, use of leisure time, worthy home membership, ethical character, and vocational efficiency.

In spite of this general drift in the proper direction, there is in individual courses much content which is no longer of any real value. It is the duty of the teacher to sift out this chaff. In its place should be inserted new content of proved value, which, along with the good in the old, should constitute the offering. Such an offering will in itself have an appeal to the average adolescent as soon as he becomes aware of its value. No adolescent of spirit wishes to waste his time on valueless materials; no teacher should force himself to the use of subterfuges to interest such a person in deadwood from the traditional period. The way out of the dilemma of uninterested pupils, on the one hand, or hypocritical defense, on the other, is to discard the deadwood and to use whatever there is of the new in the field together with the valuable in the old.

Convince the Pupil that the Work Is Worth While

This step should follow the one just discussed, that of making the offering worth while; yet all too often it is attempted alone, and sometimes successfully, because it is possible to convince a child or even an adult that a valueless offering is worth while. Witness, for example, the gold-brick salesman.

One would go far to find a greater crime against childhood than that of enticing the youngster into worthless activities and causing him to work zealously with full faith in the teacher's integrity and complete confidence in the value of the outcome. Certainly there could be no greater crime against truth. The teacher's ignorance of the worthlessness

¹ A. K. Loomis, Edwin S. Lide, and B. Lamar Johnson, *The Program of Studies*, National Survey of Secondary Education, Office of Education Bulletin, 1933, No. 17, Monograph No. 19, p. 272. United States Government Printing Office. x + 340 pages.

of the activity does not lessen the crime. The teacher is obligated to know; and the test is simple: Does the activity or content contribute toward the stated purposes of secondary education? Until an affirmative answer can be given to this question regarding any activity or bit of content, it is criminal to induce children to perform or master it; when the content is worthless, it becomes sheer hypocrisy to prostitute the confidence of the pupil, to use one's force or charm or personality, or to resort to any other subterfuge in stimulating the child to activity.

After the content has been made worth while, however, it is legitimate and often necessary to convince the pupil of its value. It is time well spent at the outset of a course to discuss with the pupil the main purposes of the course, to point out the immediate and deferred values it has for him, and to permit the pupil to select from a general overview of the course those portions which he considers most closely related to his immediate and ultimate purposes. To permit him, later, to concentrate chiefly upon the parts of greatest value to him will go far in convincing him of the value of the subject. There is no surer way of whetting a pupil's interest in a course than by proving to him that the course contains much which will be of real value to him. Once he clearly understands that point, little activity is needed on the part of the teacher.

Provide Conditions Conducive to Learning

It is of primary importance in providing conditions conducive to learning that the teacher maintain a favorable attitude toward the pupil. By favorable attitude is meant the attitude implied above in Chapters III and IV. Chapter III outlined procedures by which the teacher could study the traits and abilities of the pupil and could use this knowledge in facilitating the pupil's progress. Chapter IV emphasized the attitude of a physician as the proper attitude of the teacher in treating cases of maladjustment. In addition the teacher must at the right moment tactfully give recognition for effort, enthusiastically encourage the pupil, and at all times act as a confidant to whom the pupil feels free to come for aid and counsel.

The atmosphere of the school should be devoid of dissension between teacher and teacher or between teacher and pupil. It should be one in which study is the popular thing to do, a condition toward which each teacher must contribute his part.

The classroom should be well lighted and properly heated and ventilated. It should contain the essential materials for the pupil's use, and

the pupil should have free access to them and to supplementary materials in the library or elsewhere. The general atmosphere of the classroom should be one of cordiality, courtesy, and comradeship in learning. In such a classroom the esprit de corps is high and wholesome activity is almost spontaneous.

Help the Pupil to Define His Purposes

This point was discussed earlier as a means of preventing pupil maladjustment. It is just as essential as a method of motivating. The pupil with no purpose or one with his purposes only hazily conceived has little incentive to effort, but with the birth or the definition of a purpose and the setting of a goal comes the desire to act.

Frequently the pupil previously lost in a maze of meaningless activities appreciates the value of school activities when he clearly defines his purposes. The pupil may be forced, enticed, or cajoled into activity which fulfills no purpose for him, but such activity will be performed halfheartedly at best. Not until he sees the activity as a means to an end which he desires to reach will he enter it with enthusiasm. Hence the teacher is performing a function of primary importance when he assists the pupil in defining and clarifying his purposes.

Make Clear-Cut, Definite Assignments

Pupils who understand the value of the offering of the secondary school and who have well-defined purposes need little aid from the teacher in addition to clear-cut instructions on procedure. Sometimes such students are even able to develop their own procedures, which is often better than to receive instructions from the teacher. The assignment, written or oral, should provide clear instructions for those who need them.

The less tractable or the less purposeful pupil also is motivated by clear instructions. The suggestions of the assignment often give immediate purpose to such a pupil by opening channels for activity. In addition to stimulating to activity the clear assignment has a therapeutic value in relieving such undesirable mental states as boredom, fear of failure, worry, and similar distracting ailments. In thus liberating the mental processes the assignment makes possible a normal reaction to other motivating methods. On the whole the task of making definite assignments is one of the teacher's major problems. Its ramifications reach beyond the present discussion and will be treated in a subsequent chapter.

Help the Pupil to Keep His Bearings

There are three aspects of the teacher's problem of keeping the pupil posted with respect to his work ; namely, the direction in which activity is moving, the pupil's success in given activities, and the pupil's failure in other activities. Each of the three aspects plays an important part in stimulating pupils to wholesome activity.

A pupil may become so immersed in activities as to lose sight of the planned outcome. The teacher, if possible, should provide at the outset the perspective necessary to overcome this possibility or, having failed in doing so, should interrupt the activity whenever it appears to be wandering from the desired route. At this juncture a comparison of the objectives should be made ; and if the new direction is leading to a better end than the one planned, the more valuable should be chosen. In any event the pupil should be enabled to keep in mind the end toward which his work is directed.

There is considerable scientific evidence in favor of keeping the pupil informed as to his progress. This practice has been found an effective method of stimulating activity. The statement by Monroe and Engelhart summarizes the evidence :

The findings of the studies referred to are almost unanimously in favor of the contention that knowledge of the progress of learning is an effective stimulus. It would be difficult to find another group of experiments in which there is as great agreement among the conclusions. . . . It is probably true that the most effective way to utilize this incentive in learning is to use it in connection with encouragement, and this, of course, implies emphasis on successes rather than on failures.¹

There may be some pupils who will not do better work after they have been told of their success, and perhaps there are more who will not do better after learning of their failures ; but the general rule is to the contrary in each case. Most pupils do better when they are told of their achievement, good or bad. The teacher, however, should be on the alert for exceptions and should not apply either aspect of the principle indiscriminately ; nor should he apply it automatically on all occasions even to cases which usually benefit from it. In short, it should be seasoned with common sense and be based upon specific knowledge of the individual pupil.

¹ Walter S. Monroe and Max D. Engelhart, "Stimulating Learning Activity," *Bureau of Educational Research Bulletin No. 51*, p. 48. University of Illinois. 1930.

Appeal to the Basic Sources of Action

This general method has been implied in each of the foregoing. Any method of motivation must be directed toward favorable reaction, which in turn must spring from either the primary or the secondary sources of activity. The point of this section is that the teacher should more or less systematically design appeals to specific basic sources. It is not implied that the teacher should become so mechanically minded as to say, "This will touch the curiosity button and that the constructiveness button"; but he should be conscious of the basic drives in planning his work. A number of illustrations of this possibility appear in the following section.

Illustrative Devices and Techniques

In using any device for stimulating wholesome activity in the secondary school the teacher should not lose sight of the more fundamental principles upon which the device is based. No teacher should rely upon indiscriminate use of superficial techniques; teaching is too fundamental a process to permit such procedure.

It is legitimate, however, to have in mind a large number of devices to be used discriminately whenever proper occasion arises. It is the purpose of this section to suggest types and illustrations of such devices.

Robbins¹ classifies devices for motivation under two main categories: devices chiefly for interest and devices which provide work situations. The devices included in the first category are exhibits of materials and schoolwork, pictorial materials, calendar of activities, bulletin board, an atmosphere related to the subject, grades, honor rolls and honor societies, and stories or anecdotes. Under devices designed to produce work situations Robbins discusses clubs based upon schoolwork, theatricals and pageants, games, songs, easy supplementary reading, special reports, constructing apparatus, making books and booklets, the class excursions, correspondence with other American or foreign schools, imitating social institutions such as a city council or court, the class journal, the school magazine, the five-minute quiz, and contests of various sorts.

The devices and techniques on pages 124-125 were found effective in certain secondary schools where they were observed. The list is in no sense complete. Furthermore, some of the procedures might have been classified under tendencies other than the one beside which they are listed.

¹ Charles L. Robbins, *The Will to Work*, Chapter VII. Row, Peterson & Company, 1928.

Even so the outline will be of practical value because it suggests procedures now being used successfully.

<i>Tendency or Drive upon Which the Device or Technique Was Based</i>	<i>Practice Which Stimulated Desirable Activity in the Schools Observed</i>
1. Sensory-motor urge :	Release of surplus energy through (a) freedom of movement about the classroom or building to obtain materials of instruction; (b) freedom to converse with associates; (c) freedom in passing between class periods; (d) physical activities, as in use of blackboard, constructing models or other needed illustrative material; (e) field trips and excursions; (f) pupil demonstrations.
2. Secondary sex characteristics	In the schools observed there was a wholesome relationship between sexes resulting from classroom group activities in which both sexes participated equally, from extra-curricular social activities, and from a practical understanding and consequent toleration and use by the teachers of wholesome actions arising from friendships of boys and girls; for example, one mixed committee was dramatizing a scene from <i>The Merchant of Venice</i> . Such social functions as parties and dances were conducted with success. In class or elsewhere occasionally a teacher, observing a boy's interest in any discussion or other activity increase at the appearance of a certain girl, would capitalize the situation by inviting the boy to lead in a debate or to perform some other task which would not only add to the progress of the class but also enable the boy to demonstrate his superior traits.
3. Self-assertiveness, or mastery	Many pupil activities initiated by teachers and traceable to this tendency were found. They include (a) recounting of personal experiences; (b) debating or participating in other formal contests; (c) acting as class or group leader; (d) creative work in art, writing, music, or in developing a theme or problem; (e) participating in class discussions or other informal discussions; (f) presenting a program to the class, the school, or the community; (g) tests and examinations.
4. Rivalry	(a) Comparison of classes by the teacher; (b) posting of test scores; (c) offering awards or special privileges; (d) conducting drill contests, such as spelling matches.
5. Imitation	(a) Use of biographical literature, wholesome fiction, and accounts of current noted characters; (b) exemplary conduct on the part of the teacher; (c) recognition of outstanding pieces of work as examples for others.
6. Gregariousness . . .	(a) Group projects; (b) socialized recitation; (c) extra-curricular clubs and other organizations.

7. Social approval or disapproval	(a) Recognition by group of individual work; (b) newspaper recognition of superior schoolwork; (c) committee appraisal of individual work; (d) group responsibility for and group censure of the individual's actions.
8. Altruism	(a) Social-service-club work by members of a social-studies class; (b) controlling distractive activities by calling attention to their injury to other members of the group; (c) encouraging students to assist others who are behind because of good reasons.
9. Constructiveness	(a) Building planes, toys, gardens, structures to illustrate stages of history or events, and other models from wood, clay, sand, or compositions; (b) designing of various types; (c) preparing stages and materials for dramatizations; (d) preparing scrapbooks, diagrams, charts, and other similar types of materials.
10. The urge to collect	(a) Preparation of museum; (b) collection of specimens for science classes and other collections for class use or as hobbies; for example, stamp, coin, or flag collections.
11. Curiosity	(a) Use of problematic situations; (b) use of posters, clippings, pictures on bulletin boards; (c) special setups of laboratory apparatus before the class period; (d) "pre-vues" of novels to be studied or of historical events; (e) films and slides; (f) charts, graphs, specimens, maps; (g) any unusual approach to a lesson.
12. Attitudes, ideals, traditions	(a) Any assignment or task or report which calls into play any attitude, ideal, or tradition which the teacher knows that the pupil possesses, as a description of customs, songs, or ideals of native lands by foreign-born pupils; limited discussions of controversial problems; opportunities for exercise of ideals of fair play, teamwork, international good will, and sensible patriotism.
13. Information and habits	(a) Projects or problems in answer to points arising from information already possessed, such as outcomes of wars, applications of principles of physics, animal life of regions of certain climatic conditions, — in short, the tracing of consequences when the details of causes are known; (b) the mental habit of challenging a conclusion or an assertion is an ever-ready source of valuable discussion; (c) typical study habits in themselves bring satisfaction when they are being pursued, a fact which may be used with profit in launching a new line of activity.

The student will find the foregoing outline useful when observing classes in action. By using it to classify observed devices for motivation he will be able to continue his analytical study of motivation.

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DIVISION II

Procedures Involving the Unit Idea



CHAPTER VI • The Development of the Unit Idea

CHAPTER VII • Features of Eight Unit Plans

CHAPTER VIII • The Workbook in Secondary School
Teaching

CHAPTER IX • Integration and Elaboration of the Unit
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CHAPTER VI • The Development of the Unit Idea

GENERAL VIEW OF THE CHAPTER

The Problem Stated

The Essential Elements of the Unit Idea

Arrangements of content into meaningful wholes

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Length of unit

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The present intermittent pursuit of work

An Illustration from "Hiawatha"

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The Problem Stated

THE four chapters of Division I presented a series of basic problems and principles which the teacher should understand before he approaches the problem of instruction. They form a foundation upon which a successful system of instruction may be built. Before classroom success can be expected with any plan of instruction the teacher must know the broad purposes of his work, must be equipped to study and understand the pupil as an individual, must be able to prevent or remedy pupil maladjustment, and must appreciate the fundamentals of motivation. Having become introduced to these underlying considerations of teaching, the prospective teacher will next wish to step inside the classroom and analyze its procedures.

Division II enters the classroom and describes a concept of teaching which for more than a generation in various forms has been in the vanguard of method. That concept may be called the unit idea. The present chapter defines the concept and discusses its historical development.

It is hoped that such treatment will protect the student against the confusion of terminology which accompanied the development of the unit idea and will give him a clear appreciation of this highly significant concept.

The Essential Elements of the Unit Idea

Arrangements of Content into Meaningful Wholes

The central fact of the unit idea is that content should be studied as complete meaningful wholes rather than in isolated or unrelated lessons or bits. This central fact applies whether the content is an experience, such as building a radio, or whether it is a topic, such as the Industrial Revolution. Content based upon the experiences and activities of children and content drawn entirely from books can alike be handled best in unified wholes, or units, which are well rounded and meaningful to the pupil. This is equally true of content derived from any combination made up of varying proportions of pupil activity, teacher experience, and printed material.

The Mode of Attack and Study

Of as much significance as the arrangement of the content into significant wholes is the manner of attack and study. The mode of approach which may be called the natural method is closely associated with the unit idea. It involves several rather distinct steps, which have been identified by various writers, as will be seen later in this chapter. The following discussion indicates that the several steps parallel the rational operation of the human mind.

When an individual is about to enter a new experience, his attention is challenged. This challenge may be in the form of a problem which he must solve in order to gain some desired end, or it may simply arouse his curiosity, his ire, his pride, or any other aspect of his mental or emotional life by containing elements which link with something in his consciousness. The linking process may be considered step one. The process may begin within the mind of the individual, or it may be stimulated from the outside. It occurs when the contact is made between some outside influence and the consciousness of the individual. His reaction ranges from mild indifference to violent excitement.

The second step consists of an analysis of the situation by the individual. He studies its various aspects and collects relevant facts. Thus

he begins his reaction to whatever the outside influence has been by assembling all the available information regarding the source of the challenge.

While the information is being drawn together as well as after this task has been completed, the individual deliberates. If it is a matter of solving a problem, he compares the various possible solutions which arise from his study of the facts in the case and which are suggested by his previous experiences. If the challenge has been an attack upon some attitude or ideal or opinion, he marshals the various maneuvers which might be used in response and searches his previous experience for comparisons. If it has aroused his curiosity, he weighs all possible answers to the mystery, which are revealed by the facts in step two. This process of deliberation over the facts constitutes the third step in the "natural method" of procedure.

Sooner or later the individual decides upon the best way to react to the situation. He has eliminated all possible solutions to the problem but one, or he has chosen a certain strategy to use in retaliation to the challenge, or he has picked out the best answer to the mystery. This process of deciding constitutes step four.

The final step is the application of the plan of procedure to the situation in hand. It may consist of solving the problem, or of answering the challenge, or of testing the theory selected to solve the mystery, or of any number of other acts intended to apply the information which has been collected, refined, and directed toward an end.

Thus far two chief features of the unit idea have been discussed: first, the arrangement of content into meaningful wholes; secondly, the series of five steps which one takes in reacting to a given situation in a logical, rational manner.

Length of Unit

A third aspect of the unit idea relates to the length of the unit or the meaningful whole of content. Length is conditioned entirely by the given situation. Thus in an emergency all five steps may be condensed into a moment, as, for example, when a driver automatically reaches for the emergency brake and presses on the foot brake in order to avoid a collision. In such cases deliberation has preceded the occurrence, and the reaction has become habitualized through constant practice. At the other extreme, a single well-rounded experience may reach over a period of six months or even longer, as, for example, the study of some crop

through its life cycle. Units of intermediary lengths might include experiences or content ranging from a few school days to several months.

The maturity of the pupil is one factor which should be considered in determining the amount of detail to be included in a given unit or the length of time devoted to it. Thus in a study of tariff less detail would be included for pupils in the seventh grade than for those in the twelfth grade.

Also, the classroom teacher in arranging the work of any group is somewhat limited by the course of study which has been set up for the given subject and grade. This restriction, however, should be removed as the teacher becomes capable of directing the activities of his pupils without outside instructions.

Interrelation of Units

While units are complete wholes within any field of experience or formal subject matter, they are not isolated. Instead they are related both to units which have preceded and to those which will follow. In a sense one's life consists of a series of related yet unitary experiences. Earlier experiences help to determine what the later will be, yet each as it comes along has a rather definite beginning and ending. In his work during any given unit the teacher will relate elements of it to elements of those which have preceded.

It is necessary to break down the larger concentrations of knowledge to fit the understanding of the pupil as well as to fit the limits of available time; yet the teacher should not permit the pupil to lose sight of the place of these smaller meaningful wholes in the larger scheme of things.

The Present Intermittent Pursuit of Work

The pursuit of a unit rises and subsides in consciousness just like the pursuit of any other activity which one experiences. Just as a busy civic leader may concentrate upon the community-fund drive, the program for his luncheon club, the bond issue for schools, one of his own business matters, and various other activities at various times during the same day or week, so may the activities of a pupil or of a group switch from one to another unit of vital interest. At present it is not possible to state definitely how many times a pupil should change from one activity to another during the course of a day. In the typical secondary school the class bell still dominates the activities and interrupts the pupil five or six times each day, far too often in the opinion of many educators.

There is a growing tendency in the more progressive public school to unify the separate courses into such composites as unified mathematics, social studies, and integrated science. This is a step toward breaking down the rigid subject-matter walls. The next step, already taken in a few schools, is that of integrating the subject matter around large units, such as "communication." For example, in such a unit in one junior high school¹ an entire morning on a given day is devoted to the mathematics of communication, another half-day to the physics of communication, another to the social implications, and so forth, drawing from each field the content needed to solve the aspect of the general problem being studied at any given time.

Such a plan will gradually replace the cut-up schedule of the present typical secondary school and lead to a more desirable type of learning than the isolated bit-by-bit procedure still found in many schools. After that change has occurred the pupil will become more independent of petty routine and clanging of class bells, and a more continual study of large significant problems or units will be possible.

An Illustration from "Hiawatha"

The five steps in the learning process outlined above may be illustrated by Hiawatha and his bow, if one may take certain liberties with the original story.

Let it be assumed that at a given time there entered Hiawatha's mind a desire to have a bow of his own. He had watched the men returning from the hunt with the deer and had learned that they used the bow in shooting deer. The idea of a bow had grown in his mind until eventually it burst into a purpose. He must have a bow of his own. This definition of a purpose, this outburst of cumulated experience into a desire, this urge to achieve or acquire, — whatever the process may be called, — illustrates the first step in the complete learning span.

To take further liberties with the story, assume that the boy began asking Iagoo how the bow might be made: the best kind of wood to be used and the portion of the tree which yielded best bows, how to get the wood from the tree and to fashion it to his strength and stature, how to carve it into proper shape. Perhaps he asked Nokomis where he might obtain a thong of buckskin for the bowstring. Thus he sought information to solve his problem. This was his second step.

¹ University of Minnesota High School, Dr. O. R. Floyd, principal. See Chapter III.

While the information was being gathered, various comparisons were made and studied. One kind of wood was compared with another, and one part of the tree with the other parts. Methods of whittling down the piece were studied, and different shapes of bows were considered. The period of study continued after the information had been collected. It constituted the third step in this experience.

At a given time his conclusions began to crystallize into a general plan of action. He decided that a definite portion of a certain tree which he had already picked out would provide the wood. Whatever possible choice of tools was made. The thong had been selected. One might imagine that just before going to sleep one night the whole plan took definite shape in his mind. This period of organizing his tentative conclusion, of deciding upon best modes of procedure, and of drawing the decisions into a well-defined plan of action may be called the fourth step in his experience of making a bow.

Eventually the plan was put into action. Various parts no doubt were tried out before the whole plan had been developed. Much fumbling occurred during this first application of the plan, and a crude product resulted. But after a certain amount of intense effort and no doubt much enthusiasm the first bow was completed. The boy had taken the fifth step, that of using his information.

These five steps constituted for Hiawatha a complete learning experience. Some relevant past experience very likely was called into play during the process, and certainly what he learned in making his first bow was used frequently thereafter; but the series of steps constituted a well-rounded unitary experience. It was a unit of his life.

The Philosophy of Herbart and the Unit Concept

The framework of the unit idea may be traced to the German educational philosopher Johann Friedrich Herbart (1776-1841) and to his followers. Herbart stressed four essentials in the learning process: clear apprehension by the pupil of each individual fact; association or comparison of the facts; systematizing and classification of the facts into concepts; "method," or the application of the knowledge learned.¹

¹ From Johann Friedrich Herbart, *Outlines of Educational Doctrine* (translated by Alexis F. Lange; annotated by Charles de Garmo), pp. 55-56. 1901. By permission of The Macmillan Company, publishers. See also, by the same author, *The Application of Psychology to the Science of Education* (translated by Beatrice C. Mulliner), pp. cv-cxiii. Charles Scribner's Sons, 1898.

The followers of Herbart divided the process into five steps, "the five formal Herbartian steps," including *preparation*, *presentation*, *association or comparison*, *generalization or abstraction*, and *practical application*.¹ The five steps may be defined as follows:²

1. *Preparation*. Preparing the pupils' minds for the reception of the new lesson. Arousing interest and purpose.

2. *Presentation*. Setting forth or presenting the facts of the new lesson. This was done entirely by the teacher before textbooks were available for students, but later was supplemented by the text.

3. *Association or comparison*. Relating the new ideas to those already in the mind of the pupil. This should be directed to "well-associated and systematized knowledge." . . . "Nowhere should heterogeneous heaps of knowledge, like piles of gravel, be brought together." Here one may observe more than an analysis of the mental process; unification of related knowledge is suggested.

4. *Generalization or abstraction*. Deriving the abstract or general notion from the concrete particulars, stating the general principle in specific terms, and relating it to previously acquired knowledge.

5. *Application*. Making use of the knowledge; applying the general principle to a practical situation. "In this manner a child's acquired ideas may be so developed, so welded together in firm, systematic, *comprehensive association*, that all his knowledge becomes a reliable personal possession."

Unfortunately the tendency to follow the form rather than the spirit of Herbart's teaching became pronounced. Whereas Herbart stressed the gradual unification of many-sidedness, or a wide variety of interests, as the basis of virtue, many of his followers were able to see only the form and apparently often failed to encourage those wider associations which would enable the student to survey with ease "his well-arranged knowledge *in all of its unifying relations* and hold it together as *his very own*."

An illustration of the Herbartian method as it was operating in an English school in 1901 shows this tendency, although the topic chosen, "The Great Fire of London," constituted a fairly well-rounded unit in itself. It may be noted that the fourth step, "generalization or abstraction," is absorbed by association and application in the illustration. It is regrettable that such an excellent nucleus for a longer learning unit was telescoped into three quarters of an hour in this particular school.

¹ From C. A. McMurry, *The Elements of General Method* (Second Edition). 1893. By permission of The Macmillan Company, publishers.

² Charles de Garmo, *Herbart and the Herbartians*, pp. 133-140. Charles Scribner's Sons, 1895.

It might very profitably have consumed five periods, with the larger portion of the first being given to preparation, perhaps the next two to presentation and association (study by the pupils), and the remainder to organization of the knowledge and to exercises designed for the application to modern life situations of all usable information derived from the study.

The illustration of a Herbartian lesson follows:¹

LESSON ON THE GREAT FIRE OF LONDON (1665)

CLASS *Oxford Junior*. TIME *Three quarters of an hour*. PREVIOUS KNOWLEDGE *Great Plague*. ILLUSTRATIONS *Picture of Old London; map to show part covered by fire*. AIM *To exercise imagination of the class and interest them in the account of the Great Fire*.

MATTER

I. *Preparation*

1. Question class on state of London at this period. Causes which made it unhealthy.
2. Compare slums of East London today and part called Old London.
3. Great Plague — its spread and destruction of 100,000 victims.

II. *Presentation*

1. People just beginning to recover from shock of plague when fire broke out.
2. *Causes of Fire*
 - (a) Outbreak in baker's shop, Pudding Lane.
 - (b) Spread owing to wooden houses.
3. *Description*
 - (a) Flickering light seen over tops of houses.
 - (b) Feeble fire-engines of day.
 - (c) Increase of fire caused by wind.
 - (d) Panic of people. Church attacked.
 - (e) No need for rumour, fire announced itself.
 - (f) State of streets, fleeing families.
 - (g) 100 churches in ashes, 400 streets.
 - (h) Ordinary means useless, extraordinary resorted to.
 - (i) Raged four days, finally spent itself.

4. *Rumours as to Origin*

{ Attributed to Catholics. Why? Cf. Nero. Inscription on Monument (name of station now).
 Pope says of it: —
 "Where London's column pointing to the skies
 Like a tall bully lifts its head and lies."

¹ M. Fennell and members of a teaching staff, *Notes of Lessons on the Herbartian Method*, pp. 108-110. Longmans, Green & Co., 1902.

5. Results	Bad	{ Loss of fortune to many.	
		{ Ruin and starvation.	
	Good	{ A blessing in disguise.	
		Rebuilding of streets	{ Two years to clear away.
			{ Original sites found.
			{ Bricks used again.
		{ Cleared away plague.	
		{ Sanitary conditions improved.	
		{ Generosity of Lord Mayor.	

III. Association

Compare Fire of London with that of Moscow. Contrast causes, effects and results as affecting the fortunes of England.

IV. Application

A word on the great results that often spring from small causes, and events that often look like calamities are in reality blessings.

"There is some soul of goodness in things evil, would men but observingly distil it out." — SHAKESPEARE

V. Recapitulation

Question on matter in points given; sketch outline on blackboard, as foundation for class to write an essay as home-work.

Herbart did not invent the learning process he described. He simply observed human learning and pictured what he saw. In his writings, as indicated above, one finds not only the framework of method by which the unit idea may be carried out with success; one finds also in his philosophy the germ of the concept as it applies to subdivision of subject matter into meaningful wholes. These were not to be divided by artificial subject-matter walls, which Herbart deplored, but into clear-cut, well-rounded learning experiences, each designed to widen the "circle of thought" and to fit into the pupil's unified system of knowledge. He advocated the correlation of subjects toward this wider purpose of unification.

The reader, as a beginning student of education, should realize that the foundation of the unit idea is more than a century old. He should not be swept off his feet by the picturesque and evangelical phraseology of the more ethereal offshoots of the idea, especially those which have degenerated into highly emotionalized cults. Education must have some emotion in it, true; but it should also retain some reason and intellectual activity. This fact should form a bit of ballast to keep the novice in education near enough the ground to guarantee safety — to his pupils.

Modern education owes much to the sound and logical, yet lucid and

fascinating, writings and teachings of Herbart, the first modern educational philosopher to retire to his Sinai and write up his observations of how man learns systematically.

Dewey's Analysis of a Complete Act of Thought

One of John Dewey's many contributions to education is his five-point analysis of a complete act of thought. The reader may be interested in comparing the steps outlined by Dewey with the Herbartian outline of a complete learning experience. Dewey may have been unconsciously influenced by his study of Herbart inasmuch as he began his career at about the time the Herbartian influence in America was at its height.

Dewey's five steps are "(i) a felt difficulty; (ii) its location and definition; (iii) suggestion of possible solution; (iv) development by reasoning of the bearings of the suggestion; (v) further observation and experiment leading to its acceptance or rejection; that is, the conclusion of belief or disbelief."¹ . . . "The first and second steps frequently fuse into one," in which case they become the sensing and definition of a purpose, the urge to overcome the obstacle which blocks the realization of a desire. In Hiawatha's case, referred to above, it was the keen desire for a bow of his own and his decision to do whatever was necessary to procure one. Step three, "suggestion of possible solution," involves the assembling of facts pertinent to the problem and the derivation from them of possible solutions to the problem. The process of derivation involves a comparison of the facts and an attempt to refine and integrate them into a working hypothesis. The fourth step is the elimination, by reasoning, of the ideas or hypotheses less likely to solve the problem and the selection of the one last remaining as the best plan of action. Finally, the plan is put into operation or the idea is tested by trial; this step is the application.

Dewey's clear analysis of a complete act of thought, together with his emphasis upon learning by doing, contributed much to the development of the project method by his followers after 1910. And the project method is one illustration of the unit idea. The influence of Dewey has been extended through the work of Kilpatrick, Bonser, Sipple, Meriam, Collings, and others.

¹ John Dewey, *How We Think*, p. 72. D. C. Heath and Company.

Purposeful Activity

A central idea emphasized by Kilpatrick and others who have done much to apply the philosophy of Dewey is that of *purposeful activity*. The pupil must have a well-defined purpose if any given classroom or other activity is to be educative for him. Furthermore, the activity must be designed to fulfill the purpose of the pupil. To meet this standard the activity must be a unit of life experience. Collings outlines the steps in purposive activity as follows :¹

Kilpatrick distinguishes four steps in purposeful activity. They are: purposing, planning, executing, and judging. The purposing step sets up the goal; the planning step prepares the means necessary for realizing the goal; the executing step performs the means; and the judging step evaluates the extent of realization of the goal. The traits of purposeful activity may be grouped under these steps. The purposing step includes initiation, evaluation, and choice of goal; the planning step initiation, evaluation, and choice of means; the execution step, execution of means; and the judging step initiation, evaluation, choice, and consummation of improvement. These groupings of traits are illustrated in the following:

TRAIT GROUPINGS IN PURPOSEFUL ACTIVITY

I. Purposing

1. Initiation of Goal
2. Evaluation of Goal
3. Choice of Goal

II. Planning

1. Initiation of Means
2. Evaluation of Means
3. Choice of Means

III. Execution

1. Execution of Means

IV. Judging

1. Initiation of Improvement
2. Evaluation of Improvement
3. Choice of Improvement
4. Consummation of Improvement

In this procedure the pupils take the lead under the guidance of the teacher in each of their steps. The outline of the Herbartian steps may still be seen in the procedure of stimulating a purpose, seeking infor-

¹Ellsworth Collings, *Progressive Teaching in Secondary Schools*, pp. 14-15. The Bobbs-Merrill Company, 1931.

mation to aid in fulfilling the purpose, comparing the means, selecting the best plan of action, and carrying it out. To these steps have been added those of judging the success of the activity, planning improvements, and consummating them. Another more important change has occurred: whereas in the Herbartian procedure the teacher and the "appliances of education" had become of major importance, in the application of Dewey's philosophy the child has become "the sun about which the appliances of education revolve." The school exists to enable the child to engage in wholesome, lifelike, purposeful activities. Such activities are meaningful wholes of experience in the child's life, each with a clear-cut beginning and ending, yet each contributing toward a well-integrated development of a larger scheme.

The Influence of the Vocational Subjects

Teachers of vocational agriculture, industrial arts, and home economics have done much to clarify the unit concept. In these practical fields the activities to be performed are those of the farm, the shop, and the home. They are actual experiences. Thus a pig project carried out by a pupil in a course in animal husbandry is a well-planned series of experiences extending over the life cycle of the pig: The pupil selects and defines his problem; collects information about swine production; compares various breeds, methods of feeding and care, and so forth; draws up his plan for his project; as the final step he raises his pig. This procedure constitutes a well-defined unit of experience.

Since the Smith-Hughes Act was passed in 1917, the teachers of vocational subjects have been refining the procedures associated with the projects in their fields. They have taken the lead in breaking away from formalized methods and in making their courses the real life experiences of their pupils. In vitalizing their own work they have set an example for teachers in academic fields.

Search, Burk, Washburne, and Parkhurst

While work with the project method was engaging the attention of Dewey's followers, another movement which also has contributed much to the unit idea was in progress: the movement toward individualized instruction through the written assignment. At an earlier period Search,¹

¹ Preston W. Search, *An Ideal School*, pp. 293-294. D. Appleton and Company, 1903.

while superintendent of schools at Pueblo in 1888-1894, developed a plan of individualized instruction which broke away from the lock step of the recitation. With respect to the recitation Search says :

I am willing to accept, as a legitimate means of individual training, any recitation when it builds itself on individual interest, gives free opportunity for individual advancement, and eliminates all dead time.

After describing the typical recitation procedures he continues :

In contrast with this, the study time and the recitation hour are merged, in the laboratory school [his], into one common period of continuous work for each and every pupil. There is recitation, but it is incidental, not objective. It fits every pupil at the point of his greatest need. It engenders a feeling of liveliest sympathy between the pupil and his teacher.

Regarding the work of Professor J. T. Draper in the high-school laboratories of Pueblo (Colorado), Oakland (California), and Holyoke (Massachusetts), Search states :

Much of the work of Professor Draper's pupils is directed by well-prepared sheets of suggestions, giving for each subject a few basic directions, a large number of references, but unlimited opportunity for personal discoveries.

The written assignment as the basis for individual instruction or "self-instruction," however, received no great impetus until 1912, when Frederic Burk, of the San Francisco Normal School, emphasized it in his training school. One of his students, Carleton Washburne, later became superintendent of schools of Winnetka, Illinois, where he has further developed the idea of the written assignment as the basis of individual instruction. Each written assignment covers a "goal," or unit of content. The Winnetka system will be analyzed somewhat in detail in the following chapter.

Inspired by Swift's book *Mind in the Making*, Helen Parkhurst devoted much time between 1908 and 1913 to developing a "laboratory plan" of instruction based upon written assignments, or "contracts," for individual instruction. Miss Parkhurst became acquainted with the work of Frederic Burk while spending the year 1915 in California as assistant to Dr. Marie Montessori, and through Burk's co-operation she tried out her plan with a group of one hundred pupils between the ages of nine and twelve. It was not until 1920, however, that the plan was applied to the high school from which it derived its name, that of Dalton, Massachusetts. Features of her Dalton plan are described in Chapter

VII. It has become closely associated with the unit idea, a logical development since the best possible scope of content for a written assignment, or contract, to cover is the unit.

The Contribution of Morrison

The most widely accepted application of the unit idea to the secondary school is the system of instruction based upon the philosophy and method of Herbart and developed by Morrison.¹ In the National Survey of Secondary Education, Billett² discovered that 9 per cent of the 8594 schools which reported provisions for individual differences specified the Morrison plan as the provision which they were using.

Morrison's five formal steps in the learning process are essentially the Herbartian. They are as follows:

1. *Exploration.* Pretesting to determine how much the pupil already knows about the topic, "establishing the apperceptive sequence between the present experience of the pupils and the new unit, and preparing the students' minds for the new unit by arousing curiosity and thereby setting up genuine motivation."

2. *Presentation.* Developing "once for all in its major essentials the understanding which the unit implies." This is the time of direct telling by the teacher with a view to making the main features of the unit clear and awakening the pupils to the value of the proposed new line of study.

3. *Assimilation.* Associating and comparing the facts as they are studied under the supervision of the teacher.

4. *Organization.* Drawing the study into outline form under proper generalized headings. It compares with the generalization or abstraction step of the Herbartians, previously discussed.

5. *Recitation.* An oral or written presentation by the pupil covering the topic. Before being able to do this effectively, presumably the pupil has applied the information to his own life and has adapted his living as the result of having mastered the unit. This is essentially an application step, though the typical schoolboy is frequently given less opportunity to apply his knowledge than was offered Hiawatha in the hypothetical case presented earlier in this chapter. In attempting to develop the pupil the Morrison plan seeks to avoid the danger Pestalozzi had in mind when

¹ Henry C. Morrison, *The Practice of Teaching in the Secondary School*. The University of Chicago Press, 1926.

² Roy O. Billett, *Provisions for Individual Differences, Marking, and Promotion*, National Survey of Secondary Education, Office of Education Bulletin, 1932, No. 17, Monograph No. 13, p. 9. United States Government Printing Office, 1933.

he wrote, "Perhaps the worst thing which an evil genius has presented to this age is knowledge without ability to use it."¹ It also meets Herbart's insistence that knowledge is of no value unless used.

Morrison's contribution is his mode of arranging content into meaningful wholes, or units, and his procedure for making the content function in the life of the pupil. In the opinion of many his contribution in this direction is the best single contribution to the development of the unit idea in the secondary school. Further discussion of the plan will be presented, with other plans, in the following chapter.

Recent Developments

The reader should bear in mind the fact that no plan just discussed is inflexible or static. All of them are applied in different ways under different circumstances, and all of them are growing. Even before a book can be written about a plan of instruction the plan will have changed in some particulars. The Winnetka, Dalton, and Morrison plans are in no sense past the stage of growth and creativeness; they are developing new devices and techniques yearly as they are used by the three persons largely responsible for them and as they are applied by others.

Since 1916 there have been various shifts in the terminology which has been used to characterize the unit idea. These shifts are revealed in Table I of Billett's report, as follows:

TABLE 5. TWO HUNDRED AND THIRTEEN ARTICLES, LISTED IN THE READERS' GUIDE DURING FIVE CONSECUTIVE THREE-YEAR PERIODS [CLASSIFIED UNDER NINE HEADINGS]²

Heading	Periods					Total
	1916-1918	1919-1921	1922-1924	1925-1927	1928-1930	
Contract plan	—	—	—	—	3	3
Dalton plan	—	1	8	23	6	38
Individual education	—	—	—	26	10	36
Laboratory plan	—	—	—	—	1	1
Morrison plan	—	—	—	—	1	1
Problem method	—	—	3	—	—	3
Project teaching	13	38	35	22	15	123
Unit assignment	—	—	1	0	1	2
Winnetka plan	—	2	1	2	1	6
Total	13	41	48	73	38	213

¹ Johann Heinrich Pestalozzi, *How Gertrude Teaches Her Children* (Second Edition; translated by Lucy E. Holland and Frances C. Turner), p. 270. C. W. Bardeen, 1898.

² Roy O. Billett, *op. cit.* p. 228.

According to Billett's tabulation of two hundred and thirteen articles on various applications of the unit idea, all thirteen articles in the first three-year period, 1916-1918, dealt with the project method. During the next period, 1919-1921, thirty-eight were on the project method, two on the Winnetka technique, and one on the Dalton plan. Since that period the number of articles on the project method has decreased and the number on the Dalton plan and "individual education" has increased.

Several points of significance are revealed in this tabulation. In the first place, most of the current concepts of the unit idea have had their main development since 1915; that is to say, they are in their early childhood. The second point of interest is the rapid rise and decline of the project method as a distinct application of the unit idea. It is conjectural whether the decline in the number of articles occurred because the educational world had learned what was meant by the project method, and hence needed fewer articles, or whether certain weaknesses of the method cropped out and lessened the enthusiasm of those who had attempted to apply it to all types of school activities. The latter conjecture seems more probable. Still another tendency revealed by Billett's table is the increase in the number of applications in recent years. Eight different names were used in 1928-1930; only one had been used in 1916-1918 and only three in 1919-1921.

To the beginning student of education, perhaps the most significant finding of Billett's entire study is the striking similarity of plans which are called by different names. With respect to the schools which had reported that they were using either the Dalton, the Winnetka, or the Morrison plan Billett says:

On the whole, however, the practices of all three groups of schools were very much alike, being attempts to develop classroom procedures adapted to the use of some form of the unit assignment.¹

Billett reaches the same conclusion with respect to seven other "new plans." After careful analysis and statistical comparison of the plans, he resumes:

Hence the conclusion is inevitable that in practice differentiated assignments, long-unit assignments, individualized instruction, the contract plan, the laboratory plan, the problem method, and the project method are one and the same thing — differing in name only.²

¹ Roy O. Billett, *op. cit.* p. 320.

² *Ibid.* p. 330.

The main point which all the recent developments have in common is that they are applications of the unit idea. Each therefore is a contribution toward the development of a significant idea in educational theory and practice. That the contributions are strikingly similar does not in any sense disparage them. All are serious attempts to improve our instructional practices. Together they have brought the unit idea to its present stage of development, and from them may be derived numerous techniques of value under any plan of teaching which the prospective teacher may later develop as his own.

The next three chapters are devoted to further elaboration of the unit concept. Chapter VII sets forth more fully the essential features of several important unit plans. There it may be seen that their elements, as described by their originators, differ more than the applications made by schools claiming to use them. Chapter VIII describes the use of the workbook in secondary schools, another practical application of the unit. Chapter IX attempts to integrate the various aspects of the unit practices into a workable whole for use in secondary schools and to elaborate their details, thus assembling and organizing the practices which have stood the test of classroom use over a period of years.

From this treatment the student should gain a clear view of the origin and application of the unit idea, and the teacher in service should obtain numerous suggestions for classroom practice.

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CHAPTER VII · Features of Eight Unit Plans

GENERAL VIEW OF THE CHAPTER

Purpose of the Chapter

The Problem Method

- The inductive procedure in problem-solving
- The deductive procedure in problem-solving
- Comparison of induction and deduction
- Advantages and limitations of the problem method
- The source of the problem
- Recent tendencies

The Project Method

- Types of projects
- Criteria of projects
- Steps in the project method
- Appraisal of the project method
- Recent tendencies

The Activity Movement

The Winnetka System

The Dalton System

The Miller Contract Plan

The Group-Study Plan

The Morrison Plan

Concluding Statement

Selected References for Further Study

Purpose of the Chapter

THE preceding chapter has given the student a summary of the growth of the unit concept in method and content. The concept relates more closely to content than to method; it is essentially the idea of teaching or learning meaningful wholes of content rather than isolated daily lessons or bits. Once the content has been divided into such units, the question of learning procedure arises. At that point method enters, illustrations of which have been sketched in the foregoing chapter.

It has been seen that the unit concept has become associated with various plans which permit the pupil to progress at his own rate. This

association has resulted from the discovery that the unit is the best division of subject matter for the pupil to proceed upon. If the individual is to proceed independently of the group, he should go forward in easily measured steps; that is to say, he should proceed unit by unit. Not all the plans for individual instruction embraced this relationship in their earlier stages; but as the unit idea grew, it was adopted by them more or less unconsciously until it has become an important element in their techniques.

The present chapter has more than historical significance. It introduces the student to the features of several applications of the unit idea. It should be borne in mind that no teacher should be a slave to any one method or technique; instead he should build up a large repertory of valuable principles and practices ready for use as occasions for them arise in teaching. Many of the most valuable aspects of modern teaching will be found in the analyses of the several plans presented in this chapter. Much overlapping will be apparent in the plans. This is unavoidable if the student is to gain a clear notion of each plan and become able to draw from the series for his own theory and practice of teaching.

The Problem Method

The problem method is an application of the unit idea because it embraces a continuous, meaningful, well-integrated activity beginning with a problematical situation and ending when the problem has been solved and the solution checked. The series of actions involved in the process constitutes a unit of experience. The procedure of the problem method is essentially that outlined by Dewey and referred to in the preceding chapter. It has frequently been called the problem-solving procedure. The objective attitude of mind which causes one to take up each of the steps systematically whenever he is faced with a problem is called the problem-solving attitude or the scientific viewpoint.

The degree to which the problem method may be used varies with the situation in hand. Some situations are purely problematical. In such cases, obviously, the problem method may be used in its entirety. Other school situations have little of the problem element in them. It would be artificial to attempt to apply the problem-solving technique to them. In school activities which contain as a part of their general make-up a number of problematical elements it is desirable for the problem method to be called into play as an aid to the more general activity. Thus the

problem-solving technique may constitute the entire activity in some situations, practically none of the activity in others, and various intermediate portions of the general activity in other situations.

The problem-solving procedure may be divided into two general types: the inductive and the deductive. During the course of any given problem the two types may take turns in being in the foreground; yet it is well to differentiate them in one's thinking.

The Inductive Procedure in Problem-solving

The process of induction draws generalizations from particulars, conclusions from facts, principles from observed practices or events; it derives hypotheses from an analysis of a given problematical situation in its attempt to solve the problem. The inductive procedure, for example, has enabled the natural scientist to build up his classifications. Ruediger¹ refers to the work of Francis Bacon in defining the inductive procedure and to the effect of his work upon Herbart. Further developments were made by John Stuart Mill. Thus for more than a century the procedure has been well defined. It involves several rather distinct steps which the student will recognize as essentially those outlined in the illustration from "Hiawatha" in the preceding chapter:

STEP 1. Becoming aware of the problem. Just as a teacher must become aware of a problem in teaching before he is in position to attack it successfully, so must a pupil be made keenly alert to any problem which he is expected to solve. Time is well spent which is devoted to helping a pupil to sense and to define the problem.

STEP 2. Analyzing the situation and collecting information pertinent to the problem which it presents. This step may involve study of textbooks; reference readings in books and periodicals; trips by individuals, committee groups, or entire classes; attending lectures by authorities; interviewing persons who may have information; or any other fact-finding procedure.

STEP 3. Assembling and organizing the information. This may be done by each individual or by groups, frequently with little aid from the teacher other than general suggestions for outlines.

STEP 4. Setting forth possible solutions for the problem or hypotheses to work upon. Usually this step will be directed by the teacher with suggested solutions coming from the pupils.

STEP 5. Eliminating hypotheses that have apparent weakness until the most probable solution remains.

¹ William Carl Ruediger, *Teaching Procedures*, p. 54. Houghton Mifflin Company, 1932.

STEP 6. Applying the solution to the situation and checking the results. If the solution should prove satisfactory, well and good; if it should fail, the entire procedure should be repeated until the correct solution is found or until it becomes apparent that the solution is beyond the grasp of the group.

The Deductive Procedure in Problem-solving

Deduction is the application of known conclusions or principles to specific cases. Thus the deductive process logically begins where the inductive procedure ends; it uses the knowledge which has been derived by induction in the solution of problems to which the knowledge can be applied. The solution of a problem in arithmetic, for example, is possible by the application of a general principle to the problem after one is certain that the problem fits the principle. The steps in the deductive procedure may be analyzed as follows:

STEP 1. Understanding the problem, as in Step 1 of the inductive procedure. In any problem-solving procedure it is essential at the outset that the problem be defined and clearly understood.

STEP 2. Collecting the information relevant to the case. This step is often included in Step 1. In teaching, it is seldom as extensive as the second step in the inductive procedure.

STEP 3. Reviewing the principles which may apply to the situation. Well-known conclusions, classifications, or other generalizations which might apply to the case are considered with the hope of finding one which fits the situation.

STEP 4. Drawing the conclusion or the inference; that is, relating the facts of the case to the principles and deciding that the case falls under a given principle.

STEP 5. Verifying the inference by applying the principle to the solution of the situation. If the solution will not check, the inference has been erroneous and, if possible, the procedure should be repeated until the correct inference is made.

Comparison of Induction and Deduction

Careful study of the two series of steps just given will reveal that the inductive and deductive procedures are similar in their inception. Both arise from a problem of some sort, and both demand a clear definition of the problem.

Their next steps are alike in activity but differ in viewpoint. Both assemble data, but the inductive procedure assembles the data with a view to organizing it into a hitherto unknown generalization, whereas

the deductive process collects the information with the idea of fitting it into an already known principle. The fourth steps also are somewhat similar. Both arrive at a generalization; but the inductive generalization is a hypothesis or a rational guess at the probable solution, whereas the deductive generalization is one selected from a store of principles already known to be true.

The two procedures are identical in the last step. In both cases the attempt is made to verify the principle by application. In induction, if the principle is verified it takes its place as an established principle for later use; in deduction, if the principle is found to cover the case in hand the process is counted as a successful application and the use of the principle has been widened.

Advantages and Limitations of the Problem Method

The problem method is a decidedly valuable tool for use in all problem situations. It provides the procedure for solving whatever problematical case the pupil may face in the pursuit of his school activities. Furthermore, many educators believe that constant practice with the problem method will build a problem-solving attitude in the minds of pupils and that this attitude will become permanent mental equipment for use in problems later in life.

Another advantage of the problem method is its aid in activities not entirely of a problem nature. In such activities those elements in the whole situation which are problematic in nature may be attacked and solved by the problem method and the solution used toward the success of the more general activity.

Douglass states that "one of the points of strength of the problem ventures has been the enthusiasm resulting from the opportunity for informality, spontaneity, and originality."¹ He makes it quite clear, however, that the method is not applicable to all types of subject matter. This is the chief limitation of the plan, if it may be considered a limitation.

The Source of the Problem

Another point of significance is the source of the problem. Should the problem be selected by the teacher or by the pupil or by the two working together? If by the teacher, should it come from the text, from the pupil's environment, or from the pupil's experiences as observed by the

¹ Harl R. Douglass, *Modern Methods in High School Teaching*, p. 306. Houghton Mifflin Company, 1926.

teacher? If the problem is to be selected by the pupils, should they be entirely free in their selection or should they be guided by the teacher? Any person's answers to these questions will depend upon his philosophy of education. The answer, on the one hand, might be a dogmatic assertion that everything should be assigned from the text by the teacher. On the other extreme, it might be an enthusiastic endorsement of the pupil as the initiator of all problems, with little guidance from the teacher. Whatever the answer, the steps of the problem method remain the same. The procedure starts with a problem, however it may have arisen, and continues to its logical end. Experience will prove to the teacher that some of the best problems will come spontaneously from the pupil's interests outside his school activities, others will arise during the progress of class discussion, others will occur to the teacher before the class thinks of them, and still others will very wisely be drawn from textbooks. No real teacher will steal from his pupils all the thrill of suggesting problems; nor will he expect all the stimulation to come from his class. Problem-setting is a co-operative matter involving interaction of immature and mature views; the results are best when the pupil and the teacher both participate.

Recent Tendencies

The problem method as a distinct procedure in teaching followed Dewey's analysis in 1910 of a complete act of thought. During the twenties it was linked with project method and much was heard of the "problem-project" method. More recently the problem method is less frequently discussed as a distinct teaching procedure but is more often considered an aspect of a generalized unit procedure. Instead of being emphasized as a distinct plan in teaching, it is considered an important tool for use whenever needed.

The processes of induction and deduction will remain distinct methods in the fields of science, where man is building his realms of knowledge; but in teaching known facts or in directing the learning of immature students the problem method serves best as one of a number of learning procedures, each to be used in its proper time in a larger scheme of instruction.

Much emphasis is now placed upon the scientific attitude as an important objective of the secondary-school offering. Toward this objective the problem method makes a highly valuable contribution. It is the basis upon which the scientific attitude is built.

The Project Method

The project, as defined by one of its earliest and most ardent proponents, is a "whole-hearted, purposeful activity proceeding in a social environment."¹ The project method of teaching may be defined as the process which enables pupils to acquire wholehearted purposes and to pursue them to wholesome consummation. It immediately becomes apparent to the reader that the project is a "meaningful whole," a unit of experience. Hence the project is another application of the unit idea.

The project method insists that the pupil have wholehearted purpose in his activities. This stress upon purpose is one point which differentiates it from the problem method. The beginning student should not be concerned, however, if he cannot see any difference between the two methods. As a matter of fact the project and the problem are children of the same parents and almost as much alike as twins, differing only in disposition, the one showing the greater emotion, feeling, and impulsiveness, and the other the greater balance, stability, and objectivity. The teacher should understand both applications of the unit concept and be ready to use whatever elements of either a given occasion may require.

Types of Projects

The following definitions of types of projects reveal an attempt to encompass all phases of schoolwork. Subsequent experience has cast some doubt upon the desirability of attempting to use the project method for all types of school experience. As defined by Kilpatrick the four types of projects are

Type 1, where the purpose is to embody some idea or plan in external form, as building a boat, writing a letter, presenting a play; type 2, where the purpose is to enjoy some (esthetic) experience, as listening to a story, hearing a symphony, appreciating a picture; type 3, where the purpose is to straighten out some intellectual difficulty, to solve some problem, as to find out whether or not dew falls, to ascertain how New York outgrew Philadelphia; type 4, where the purpose is to obtain some item or degree of skill or knowledge, as learning to write grade 14 on the Thorndike Scale, learning the irregular verbs in French.²

The four types may be termed the objective, the aesthetic, the problem, and the skill projects. The first type originated with the special

¹ William H. Kilpatrick, "The Project Method," *Teachers College Record* (September, 1918), 19: 319-335. Teachers College, Columbia University.

² *Ibid.* pp. 332-333.

fields of industrial arts, home economics, and agriculture. Kilpatrick was hesitant to include the aesthetic experience as a type but decided to do so because "the factor of purpose undoubtedly guides the process." The problem type of project is essentially and completely the problem method, derived from "the work of Professors Dewey and McMurtry." It may be questioned whether type 4, the skill project, can successfully incorporate all the ideals of the project with the spontaneity desired by the proponents of the idea.

Criteria of Projects

The following criteria may be used for the evaluation of projects. They have been derived from extended use of the method.¹

1. A project should be a richly valuable experience for the pupils.
2. The project must be an experience for which the pupils are prepared and in which they freely express their abilities.
3. The project should release for each pupil the best he has to give in the way of participation.
4. The project must actually bear fruit.
5. The project must bring the best results with the least waste. (Unfortunately, current instruments of measurement do not adequately measure the more important outcomes claimed for the project method. This has caused its advocates to question the measurement movement, which in turn has caused enthusiasts for measurement to question the project method. Further progress in measurement should result in a more substantial basis for discussion than the present mutual misunderstanding.)
6. The project must be conducted in its natural setting.
7. The project must be drawn from the experiences of the pupils.
8. The project must be developed by the pupils.

Steps in the Project Method

For the objective and skill types of projects the following steps have been outlined by the proponents of the project plan :

STEP 1. *Purposing.* During this stage the pupils, preferably of their own initiative, set up the goals which they wish to attain. They identify their purposes and presumably become intensely interested in the undertaking which they have proposed.

STEP 2. *Planning.* The various means for attaining the purpose are assembled, compared ; and the one plan finally selected is carefully refined.

¹ See also James F. Hosic and Sara E. Chase, *Brief Guide to the Project Method*, Chapter VIII World Book Company, 1924.

STEP 3. *Executing*. This step applies the plan which has been developed in the preceding stage of the project.

STEP 4. *Judging*. A check of the success of the plan is made as the final step. If the results have not been satisfactory, suggestions for improvements are made, considered, selected, eventually carried out, and their results noted.

The problem type of project follows the regular steps of the problem method as outlined in the preceding section. We may question the desirability of attempting to set up a set of formal steps for the aesthetic type of project; it is doubtful whether appreciations and feelings can be tied up with any set plan. They are associated with all types of teaching and refuse to follow set schemes. Perhaps it was largely for this reason that the exponents of the project idea have not seriously attempted to isolate a series of steps for the aesthetic type of project.

Appraisal of the Project Method

The project method has been applied for approximately a quarter of a century. During that time the strong points and the weaknesses of the plan have come to the surface. The beginning student of education should realize at the outset of this appraisal that many of the best features of the project method are not new but have been used by wise teachers for many centuries. Also he should realize that some of the weaknesses arise from the general human traits of the teachers who have applied the idea rather than from the idea itself. These two facts should be considered in interpreting the following lists of strong points and weaknesses.

The major advantages or strong points of the project method are as follows:

1. The project method stresses pupil purpose. Unquestionably much of the waste in secondary-school work results from the lack of purpose on the part of the pupil. Any conscious attempt to stimulate purpose is a step in the proper direction in educational theory and practice.

2. The project method attempts to base motivation on natural interests. By seeking to aid pupils in the pursuit of the wholesome interests they already have, as well as to develop new interests from the old, this method should do much to enliven school activities.

3. The project method attempts to use pupil experience. At every step the pupil is encouraged to draw upon past experiences which will aid in achieving the new purposes. The pupil thus becomes a valuable source of reference, and the act of contributing from his own experience further motivates him.

4. The project method encourages freedom of expression and applies Dewey's philosophy of learning by doing.

5. The project method emphasizes creativeness and offers the opportunity for each pupil to create to the extent of his ability.

6. The project method attempts to care for individual differences. Theoretically, each child is permitted to develop in a well-rounded manner and at a rate which fits his own ability.

7. The project method carries the pupil forward in well-defined units of experience.

8. The project method attempts to eliminate useless materials from the curriculum.

9. Through emphasis of the positive and of successful achievement the project method attempts to decrease the amount of failure and eventually to eliminate entirely the sense of failure. By these means and others it seeks to produce, as its main objective, rich, vibrant, positive personalities.

The following reactions of critics reveal the chief weaknesses of the method :

1. The work of the school when carried forward on the project plan tends to be chaotic. There is a distinct lack of organization. Unless guided, the program is likely to be whimsical ; and if guided much, it loses the essential project element.

2. The project method leaves wide gaps in the content. For example, it has not been demonstrated that, if the true project method were applied, the mastery of arithmetic would be satisfactory.

3. Under the project method, its critics maintain, there is much lost motion. This is a debatable point and will remain such until an acceptable definition of lost motion is derived. What may appear as lost motion to the critics is often considered a part of the purposing step by the project-method group, who in turn maintain that the ultimate motive power derived from the purposes more than compensates for the purposing time.

4. The project method taxes the genius of the artist teacher and is beyond the ability of the typical teacher. While this criticism is quite true, it should not be launched against the idea. Instead the training period of secondary teachers should be materially increased.

5. The project method does not fit all types of desirable school activities. This is also a debated point ; but it seems a valid criticism at our present stage of educational development.

6. Some critics of the project method have condemned it as a sugar-coated technique. They claim that, after all, the business of education is severe work, not idle play ; that any person, to become cultured and civilized, must undergo the rigorous discipline of orderly procedures.

This point, like others, is hotly debated by the opposing sides, and each group thereby becomes more deeply convinced of its own views. It remains for fresh minds to take an unbiased view and to draw their own conclusions.

7. The unwillingness of some advocates of the project method to submit it to rigorous experimentation has turned some of the realists in education against the method. Co-operative effort of the two groups in developing devices to measure outcomes considered more important than subject matter, and the use of the devices in experiments approved by both groups, will be beneficial to the general field of method.

8. The project method has led to an overemotionalized attitude toward teaching on the part of some of its more ardent supporters. This, however, should not cause the beginning student to refuse to glean from the method its valuable features.

Recent Tendencies

What was said of tendencies in the problem method applies for the project method. Among many leading educators, there has been a tendency to consider it as a technique highly desirable as one aspect of a wider plan of instruction. Not a large number would attempt to use it under all occasions. Its viewpoints of spontaneous interests and enthusiastic participation are inherent parts of the teaching procedure of all progressive public schools, but its techniques are applied only when their use is economical and contributory to the organized program of the school.

The Activity Movement

An outgrowth of the project method is the attempt to make the activities of the pupil the center of the school program. Neither the proponents nor the critics of the movement are able to describe it in clear terms.¹ Views range from that which would make pupil activity the sole basis of the school program to that which would have it as only a minor source; that is to say, there are radicals and conservatives among the "activists." With some the movement has taken on a religious fervor, thereby becoming an emotional rather than an intellectual enterprise. This tendency for the extremists to become a cult has caused many educational leaders to look upon the whole movement with suspicion. The exploi-

¹ Guy Montrose Whipple (editor), "The Activity Movement," *The Thirty-third Yearbook of the National Society for the Study of Education*, Part II. Public School Publishing Company, 1934.

tation of the term "progressive" by the group in general, as though no one except an activist could be progressive in his educational theory and practice, has further retarded the progress of the better phases of the movement by arousing resentment and antagonism. For example, some critics agree that "all that is good in the movement is not new, and all that is new in the movement is not good."

It is possible here only to mention some of its main historical sources and to refer to its chief features. Five centuries ago Vittorino da Feltre (1378-1446) "employed games in teaching the youngest, stressed physical training through games and exercises because of their influence on mental alertness, favored mild discipline, recognized differences in mental capacity, and declared his belief in the necessity of following nature's need."¹ During the last five centuries a small minority of the educators in each generation have condemned bookishness and have urged that the things of vital significance to the pupil's personal welfare be stressed in the schools. In speaking of Comenius (1592-1670), Woody continues:

This recognition of man's tendency to enjoy action, his *readiness* for it, even though it might be toil, and his *intolerance* of inactivity were the justification for his pronouncement concerning the method of activity.²

From other early educators the same writer quotes:

Go my sons, . . . burn your books, . . . buy yourselves stout shoes, get away to the mountains, search the valleys, the deserts, the shores of the sea, . . . and the deepest recesses of the earth. — PETER SEVERINUS

Nature would have children be children before being men. . . . To live is the trade I wish to teach him. . . . Our pedantic mania for instruction is always leading us to teach children things which they would learn much better of their own accord. — ROUSSEAU

In his [Froebel's] doctrines of education through play, education as free development, the educational value of motor activity, connectedness, continuity, culture epochs, creativeness, self-activity, and social participation, we hear reverberations of earlier educators from da Feltre to Pestalozzi. . . . Between Froebel's dictum that learning "a thing in life and through doing is more developing, cultivating, and strengthening than to learn it merely through the verbal communication of ideas," and the views of present leaders in the activity school, there is profound agreement.

¹ Whipple (editor), op. cit. Chapter II, "Historical Sketch of Activism," by Thomas Woody. Quoted by permission of the Society.

² Ibid. p. 12.

Admitting that Herbart's philosophy tended to limit "activity on the physical side," Woody credits him with three contributions which have influenced the modern activity movement:

Herbart contributed much to the understanding of the mind and its growth by (1) destroying the faculty psychology and its corollary, formal discipline, (2) his conception of a genetic soul, and (3) the doctrine concerning the cultivation of many-sided interests.

In the United States during the nineteenth century the fight against formal bookishness was waged, according to Woody, by Bronson Alcott, Gallaudet, David Page, Susan Blow, William T. Harris, Francis W. Parker, and others.

Dewey tested the new education in his experimental school established in 1896. His subsequent writings have been the greatest single influence upon American education during the present century. He has sifted the past and to its nuggets has added those from his own mind. The private schools which have taken the lead in activism are patterned after Dewey's experimental school. Some of these schools are rendering real service to education by pioneering further in the field of method, particularly along the lines advocated in Chapters III and IV of this volume. Little statistical experimentation based upon objective subject-matter tests has been carried out in these schools because such tests do not measure the main outcomes which they seek. Their contribution will be widely accepted by the typical school as soon as more delicate measuring instruments have demonstrated the value of their programs in the development of personal traits not measurable by subject-matter tests.

The strong features of the activity movement are those of the project method, somewhat emphasized: stress of pupil purpose; motivation through interest; use of pupil experience; self-expression, learning by doing, and creativeness; recognition of individual differences; unitary experience; elimination of useless curricular content; elimination of failure; and the development of well-rounded personalities. The reader should understand that these features are in no sense limited to the experimental schools. They may be found in various stages of attainment in hundreds of the more progressive public schools.

The weaknesses ascribed by critics, likewise, are those previously mentioned under the weaknesses of the project idea: The program is sometimes chaotic; it leaves wide gaps in one's understanding of a field; there is some lost motion; teachers' limitations frequently impair the

work; the idea does not fit all desirable activities of the modern school; it is accused of being "sugar-coated procedure" to escape reality; the aversion to current statistical experimental techniques antagonizes the realists; and the tendency for activism to become a cult is an unfortunate development.

The Winnetka System

Reference was made in the preceding chapter to the work of Frederic Burk and to that of Carleton Washburne, one of his students at the San Francisco Normal School. Washburne was selected as superintendent of schools of Winnetka, Illinois, in 1919 by a progressive-minded board of education "with the avowed purpose of making the schools modern and progressive."¹ The original suggestions of Burk, the encouragement of the Winnetka Board of Education, the co-operation of the Winnetka school staff, together with the creativeness and leadership of Washburne, have made the Winnetka schools the foremost illustration of individualized instruction in the United States. An analysis of the Winnetka system of instruction will reveal many techniques which are usable by any teacher, even where the entire system is not being followed.

Features of the Winnetka System

The reader should immediately discard the erroneous notion, almost invariably associated with the word "plan" or "system," that the series of procedures presented below represent an unchanging, static scheme. "Such organization would be contrary to the policy and spirit of the Winnetka Public Schools."² The ideas applied at Winnetka are still alive and growing. Experience gained one year is used as the basis of new developments the next, and constant experimentation results in altered details in the main features. The following descriptions, however, give in broad outline the chief characteristics of the system :

1. The curriculum is divided into "common essentials" and "group and creative activities." The two divisions are defined as follows by the survey committee :

"Common essentials" are supposed to include those knowledges and skills which will be used by practically everyone -- a certain speed and accuracy in arithmetic; the ability to use the common forms of punctuation and capitali-

¹ Carleton Washburne, Mabel Vogel, and William S. Gray, *A Survey of the Winnetka Public School*, p. 15. Public School Publishing Company, 1926.

² Carleton Washburne, *Adjusting the School to the Child*, p. v. World Book Company, 1932.

zation correctly; the ability to write legibly and with reasonable speed; the ability to read with a certain degree of speed and comprehension; the ability to spell correctly the most commonly used words; information concerning commonly known persons, places, and events; and ability to discuss intelligently the outstanding civic, social, and industrial problems confronting the American people.

"Group and creative activities," on the other hand, include those things in which the results achieved by the children may legitimately differ — the appreciation of literature, music, and art; playground activities; assemblies; handwork of various kinds; projects which are an end in themselves rather than a means to the mastery of subject matter; dramatizations; discussions (again not for the purpose of learning common essential facts); and much of the color material and background of history and geography.¹

2. Progress in the common essentials is strictly individual. Techniques and procedures for this progress are as follows:

- a. The common essentials are broken into units of achievement, or "goals."
- b. Each child proceeds, unit by unit, irrespective of the progress of the other pupils, as rapidly as he attains 100 per cent mastery of the work included in the respective units.
- c. Each "goal" is printed on a goal card. When a given pupil completes the goal, the date is recorded on his goal card.
- d. His mastery is checked by a diagnostic test which indicates his weaknesses if he has not attained complete mastery.
- e. Self-corrective practice books and printed instructions for their use are available for pupils whose diagnostic tests reveal specific weaknesses. These self-instructive materials lead the child step by step very gradually from the elements he knows to the elements he is to learn.²
- f. The teacher helps the individual pupil, and presents a topic to an entire class when such a procedure is considered economical.
- g. The child corrects his daily work according to written instruction, but the mastery tests are corrected by the teacher.
- h. Promotion is by subject and occurs for a given subject when the pupil has achieved all the goals for his grade. Thus he may be in fourth-grade spelling, fifth-grade history, and sixth-grade arithmetic at the same time, although in practice a pupil is rarely in more than two grades at any given time.
- i. A child's social age is the chief factor in determining the room in which he studies. Thus in any given room the pupils may be of several different grades, but all will be of approximately the same social development.

¹ Washburne, Vogel, and Gray, *op. cit.* pp. 15-16.

² *Ibid.* p. 19.

- j. Grades are not repeated. A child simply masters each unit of a given grade before going to the next unit. Some may master all units of all subjects of a grade in eight months, some in twelve months, some in eighteen; but none will repeat a grade.
- 3. "The socialized and self-expressive activities — or group and creative activities, as they are more accurately termed — are handled in an entirely different way."¹ The following practices apply to these group activities:
 - a. There are no set goals, no preparation, no tests.
 - b. These activities occupy one half of the morning and one half of the afternoon.
 - c. School progress is not affected by the pupil's success in them; they are ends in themselves, and "grow out of children's interests or out of their history-geography work."
 - d. The group or creative activities include discussions of real life problems of the pupil; self-government activities, including committees on care of plants, care of grounds, playground rules, assembly programs, and home-room activities; dramatics, to which much time is devoted; projects carried out without a view to using the results, but entirely for the expression which the project offers; assemblies; handiwork; art and music; and physical education. In art, music, and physical education the instructional parts are carried out in the common-essentials program. Their use during the group periods is entirely for expression and development of social traits.
- 4. The usual marking system is not used. Instead the pupil receives a goal card. On the front are entered the dates when he completes his respective units. On the back is the pupil's rating, derived co-operatively during a conference with his teacher, on such qualities as group spirit, self-reliance, initiative, work spirit, orderliness, and special interests.
- 5. From the foregoing the underlying philosophy of the system may readily be seen. This philosophy may be summarized as follows:
 - a. Each child should be permitted to progress at his own rate if each is to attain his maximum individual development.
 - b. Each child should also develop a strong social consciousness through group activity.
 - c. There should be ample opportunity for creative expression.
 - d. From a broader perspective the common essentials are considered the fundamental tools which society demands of each person. He should master these tools in the most economical manner, which, according to the Winnetka belief, is through individualized instruction. Furthermore, the child lives in a social environ-

¹ Washburne, Vogel, and Gray, op. cit. p. 20.

ment, one in which the tools must be used for the good of all; consequently he must have the many social experiences provided in the group activities.

6. An outstanding feature of the Winnetka plan is the amazing amount of educational experimentation or statistical research which has accompanied the instructional program. This involves derivation of curriculum content; subdividing it into proper grade levels, then into goals or units; preparation and standardization of the diagnostic tests; preparation and refinements of the instructional booklets and practice exercises; and scientific study of behavior problems. The experimentation is constant and is used as the main instrument for the development of the new practices which are continually being adopted.

The Dalton System

The inspiration for the Dalton, or laboratory, system of instruction came in 1908 from Edgar James Swift's *Mind in the Making*, according to the author of the plan. Miss Parkhurst, then a teacher of experience in elementary and secondary schools as well as in teachers' colleges, had long realized that the traditional bookishness of the schools stunts children's mental development. From 1908 to 1913 she worked on materials for a plan which would liberate children from the deadening influence of formalized learning and transform the school into a community in which the child might have freedom to develop himself. During this period she was influenced much by the work of Dewey, and later she was encouraged by Madame Montessori and Burk. In 1919 the plan was applied to the Berkshire Cripple School for boys, and in 1920 to the regular high school of Dalton, Massachusetts. By 1930 approximately 650 American high schools were using the plan either in its entirety or in a modified form,¹ and Dalton schools may be found on every continent.

Features of the Dalton Plan

1. *Freedom and co-operation.* The fundamental principles of the plan are freedom for self-development, co-operation in normal "community" life, and economy through the budgeting of time. The community is the home room (called a house), which is composed of pupils from all grades rather than from one grade.

2. *Major and minor subjects.* As in the Winnetka plan, the curriculum is divided into two parts: the major subjects, which correspond to the

¹ Roy O. Billett, *Provisions for Individual Differences, Marking, and Promotion*, National Survey of Secondary Education, Office of Education Bulletin, 1932, No. 17, Monograph No. 13, p. 266. United States Government Printing Office, 1933.

Winnetka common essentials; and minor subjects, which correspond to the group activities of the other plan. Under major subjects are mathematics, history, science, English, geography, foreign languages, and other academic subjects. The minor subjects include music, art, handiwork, domestic science, manual training, gymnastics, and other special fields.

3. *Promotion and expansive influence.* The major subjects alone are used as the basis for promotion. According to Miss Parkhurst¹ the value of the minor subjects lies in their expansive influence upon the student. The study of them creates a response to beauty and also an increased power of expression.

4. *Contracts.* The contract is the central feature in the operation of the Dalton plan. It is a month's block of work, subdivided into weekly and daily portions. Its chief elements and characteristics are as follows:

- a. It is written. Contracts are prepared by the teachers, mimeographed or printed, and given to the pupil as he progresses, contract by contract.
- b. It constitutes one tenth of a year's work (one ninth in a nine-month term). Hence, when a pupil has completed ten contracts in freshman English, for example, he is ready for sophomore English and begins its first contract. This may happen at any time during the year, in English or any other subject.
- c. The contract is usually limited to the major fields, but not always.
- d. The first part of the contract is an introductory paragraph intended to link the new to the old in the field being covered.
- e. A series of learning exercises follows. They may be topics to be studied, problems to be solved, written work to be prepared, memory work, special reports, or other kinds of work to be performed.
- f. The exercises are evaluated in terms of daily portions of work, or units of work. (These units are not to be confused with the larger units, or meaningful wholes. The entire contract closely resembles the larger unit, although the monthly division is often artificial.)
- g. The contract contains specific references to bulletin boards and to various texts and reference books.
- h. Departmental cuts are also carried in the contract. A departmental cut is work done in one department which is acceptable in another, as, for example, a theme for English based upon some topic in history credited as one or more units of work in English and at the same time aiding the student in history.

5. *Laboratories.* The entire Dalton plan is often called the laboratory plan because it replaces classrooms with laboratories. There is no history

¹ Helen Parkhurst, *Education on the Dalton Plan*, p. 29. 1930. E. P. Dutton & Co., Inc., publishers, New York, and George Bell & Sons, Ltd., London.

classroom, for example; instead there is a history laboratory, equipped with all the materials of study and work that the pupils in history need. At any given time pupils from all four (or six) years of secondary-school history may be working individually in the history laboratory. So with all other subjects. The teacher of history remains in the history laboratory for assistance as needed.

6. *Conferences.* Regular conferences are held. Sometimes these are scheduled on the bulletin board. Also, the teacher may occasionally put a special notice on the bulletin for a certain pupil to come for an unscheduled conference.

7. *Time-budgeting.* One of the problems discussed at a conference is that of allocating the pupil's time according to his subject-matter needs. His budget of time is either approved or revised by the teacher. During the conference his various subjects are listed as strong subjects or weak subjects, according to his standing in them. His time is then budgeted with a view to bringing him up to standard in all subjects. If he is behind in English and ahead in mathematics, his budget may call for twice as much time in the English laboratory as in the mathematics laboratory until his English is brought up.

8. *Graphs.* The teacher keeps a laboratory graph for each grade which works in the laboratory, and each pupil keeps one contract graph to show his standing in the several subjects he may be taking.

a. *Teacher's laboratory graph.* This graph is a letter-size sheet of paper ruled both ways. Down the left side the names of the pupils in a given year are listed. At the right of the list are twenty squares, one for each school day of the month, divided into weeks and numbered from one to twenty. As a pupil finishes a unit of work, a line is drawn through one square beside his name. His goal is to have the line extended through the twenty squares, thus showing that his monthly contract is complete. At a glance the teacher can see the relative standing of various members of the group in any given subject.

b. *Pupil's contract graph.* This form records the number of units of work completed in each subject carried by the pupil. In addition to the pupil's name and class it carries columns for the subjects he is pursuing and is ruled off into twenty spaces for each subject. As he completes a unit of work in any subject, a line is extended through one space. The pupil keeps his graph. During the conferences it reveals immediately the strong and the weak subjects.

9. *The day's work.* The day's work is divided into four parts:

a. At the beginning of the day the pupils assemble in their home rooms, or houses, for a brief organization period, to plan their work individually for the day. This requires about fifteen minutes.

- b.* The pupils then disperse to the subject-matter laboratories according to their plans for the morning. There they work until conference time, either the entire time on one subject or otherwise if their time budget so regulates their work.
- c. Conference time.* The last hour of the morning is devoted to group activities. The first half of the hour may be devoted to an assembly period, to some group project, to a special lesson, or to a group report. The second half is spent by the teacher in presenting either subject matter outside the pupils' experience or references, in conducting discussions over certain portions of the work in a given grade and subject, or in review and recitation. During this last half-hour a different subject is scheduled for each day of the week.
- d. Afternoon.* The entire afternoon is devoted to scheduled activities in the minor subjects: music, art, physical education, and practical arts. This is almost entirely group work, and it follows the typical school program more closely than the morning activities do, with the exception that it is for "expansive influence" entirely and not for purposes of promotion.
- 10. The pupil's progress.* The pupil advances at his own rate, although there is less flexibility in this regard than at Winnetka. Apparently the time-budgeting factor and perhaps other factors tend to keep the pupils closer together than at Winnetka.
- 11. Examinations.* While the idea of examinations is not endorsed wholeheartedly, an examination is given over the contract at the end of the month. These examinations are not as thoroughly diagnostic as the Winnetka examinations. Measurement is not considered an essential feature of the program.

The Miller Contract Plan

The Winnetka and Dalton plans are contract plans. Both differ from the plan now to be discussed in one important characteristic: Whereas in the Winnetka and Dalton plans the assignment or job or contract is prepared by the teacher, written out in advance of the pupil's attack upon the problem, and handed him for individual work, in the contract plan devised by Miller the contract, or "challenge," is built by pupils and the teacher working together after a problem has arisen and is subsequently performed as a group enterprise. The Miller application of the unit idea has many characteristics in common with the project method carried out in its more liberal form. It is another rebellion against formal, traditional book learning, against compulsory classroom procedures.

Features of the Miller Contract Plan

The word "plan" applies even less to the procedures developed by Miller than to the Winnetka system. The various techniques it involves are in no sense rigidly fixed; they change with use. The reader should bear this in mind while considering the following features:

1. *Freedom of expression.* The underlying philosophy of the various procedures resembles that of the Dalton plan and the other attempts to give the pupil freedom of expression. An attempt is made to blend liberty and authority in much the same way that is present in a well-organized orchestra in which each musician submits to the discipline necessary for harmonious results.

2. *Units of learning.* The daily lesson is eliminated. "A clean sweep will be made. A working group will be substituted for the conventional class organization. *Units of learning, comprehensive in their nature, will be substituted for 'lessons.'*" . . . "*Pupil power will have right of way over teacher talk.*"¹

3. *Development of the contract.* Three processes, or "movements," are involved in developing a contract:

a. *Problem-raising movement.* This is similar to the Herbartian preparation step and the Morrisonian exploration period. The purpose is to "present a challenge," to link the experience of the group to the new problem, to get their reactions, to whet their interests, to cause them to feel the problem. In some cases this may be done in fifteen minutes; in others it may require a full period. The principle of *guide lines* is used. An artist may draw three lines which meet at a given point and, from that start, develop a box, a house, a table, or any one of a hundred other objects by adding new lines to the original three guide lines. So may a teacher derive from a few minutes' discussion several basic principles or guide lines. For example, on the problem of prohibition the two basic guide lines might be "*a. Individual liberty versus social constraint; b. National control versus state rights.*"² From these guide lines, set during the "problem-raising movement," the entire outline would be built.

b. *Directing-study movement.* With the problem raised, the group spends several days gathering information, listing further avenues of study, and individually pursuing specific phases of the problem. This gives opportunity for individual work. An hour may be spent, after this process has continued two or three periods, in relating the work of various pupils to encourage group

¹ Harry Lloyd Miller, *Creative Learning and Teaching*, pp. 10, 12. Charles Scribner's Sons, 1927.

² *Ibid.* p. 35.

work and to integrate the main portions of the problem. Outlines may be discussed, further problems raised, especially good creative work given recognition, and numerous points cleared in the pupils' minds. This "movement" ends with a check of the pupils' understanding. It is not often an examination of the old or new type, although it might be. More often it is an activity designed to demonstrate the pupils' mastery. Materials are organized ready for the final stage of the contract.

- c. *Organizing, unifying movement.* This is an hour or more of socialization with all pupils participating in the discussion. In the prohibition contract a debate occurred on the final day. Other forms of the organizing movement are dramatization, project demonstrations, exhibitions of workmanship, "snappy" recitation work, and co-operative group presentations. This process attempts to unify the knowledge of the unit, to bring the experience to a well-organized conclusion.

4. *The concentric-circle idea.* Some contracts, or challenges, are started by inserting a challenging thought in a central circle or square. This central idea is developed by listing problems and exercises in circles or squares which widen with the difficulty of the subchallenges they add to the picture. For example, "A Journey into the Plantagenet World" might be in the central section. Around it, within a second circle, pupils and the teacher might add "Reading of *Ivanhoe* (not every page of it by every pupil)," "Mastery of leading events in *Ivanhoe*," and optional work of various types. In the next wider circle might be added "Sketches of characters (Rebecca, Gurth, etc.)," "Drawings of castle, moat, turret, drawbridge," and other suggested activities. In the widest circle might be listed "Brief account of making of English language," "Dramatization — 'Gurth and the Outlaws,'" "An essay or sketch in writing, illustrated perhaps, dealing with some phases or scenes in *Ivanhoe*."¹ Such self-assignments would be built up as the study of the contract progresses, some exercises being performed before the whole chart is completed, while others would be outgrowths of those completed. This concept could be carried out to almost limitless proportions from any challenging beginning. The time given to any challenge should be governed by the value gained from it.

It may readily be seen that the Miller contract as an application of the larger unit idea requires that the teacher be stimulating and imaginative. While the possibility exists that the procedures will become chaotic unless the teacher keeps the activities within reasonable bounds, when the system is applied in its moderate forms it is unquestionably vitalizing in its effects upon classroom work.

¹ Miller, op. cit. p. 98.

The Group-Study Plan

The group-study plan provides for the division of any given class into two or more groups of similar ability. Thus a senior class of thirty pupils in history might be divided into a poor group of eight, an average group of ten, and a bright group of twelve. Each group proceeds upon a given unit to the limit of its ability. Thus the dull are not discouraged by the bright, and the bright are not retarded by the dull. The plan is particularly well adapted to schools too small for ability grouping by whole classes, and to subjects in large schools in which too few pupils are enrolled to section them by classes. It may be called a plan for homogeneous grouping *within* classes rather than *by* or *between* classes.

The group-study plan embodies the principles of the Miller contract plan,¹ and it has the same philosophy of pupil freedom as that plan.

Features of the Group-Study Plan

New developments beyond the Miller contract plan may be noticed in the procedures of the group-study plan.

1. *Habituation to self-activity.* The responsibility for learning is shifted entirely to the pupil. It is his affair, and he is taught to accept and meet his responsibility.

2. *The challenge.* Each group builds its own assignment, or challenge, aided by the teacher. It gradually takes form on a 36 by 48 inch sheet of heavy paper hung on the wall. Outlines, problems, suggestions, and exercises are written on the sheet with colored crayon.

3. *Pupil leaders.* Since there are several groups at work in the same room, the need for group-leaders arises. These positions rotate among the members of the various groups. They lead group discussions, check work of the members, and stimulate group activity.

4. *The pupil's creed.* This innovation is as follows, subscribed to by each pupil.

I believe :

1. That when I study properly I am my own best teacher.
2. That, like a builder, I need a plan.
3. That, like the spider, I persevere step by step.
4. That my attention must not wander until my task is done.
5. That repetition fixes knowledge in my mind.
6. That my work is not finished until I have checked it.
7. That when I teach another my reward is greatest.²

¹ Edward R. Maguire, *The Group-Study Plan*. Charles Scribner's Sons, 1928.

² Ibid. p. 43.

5. *The "How-to-Study" chart.* A chart shows a plan to follow in studying.

Study depends upon :

1. Organization : I must arrange my subject-matter in order under topics and sub-topics.
2. Repetition : An ounce of self-drill is worth a pound of instruction.
3. Concentration : All my time is wasted unless I put my whole mind on my work.
4. Creativeness : An ounce of creativeness is worth a ton of absorption.¹

6. *Study steps.* The pupil is taught the scientific procedure of problem-solving by applying the following steps : "I state my problem. I analyze my problem. I plan my work. I work my plan. I check my results."²

7. *Lesson organization.* An illustration of the lesson procedure is as follows. In both groups the challenges had been prepared in previous discussions.³

HISTORY · EIGHTH YEAR

Group A

Five minutes : A review quiz

Group-leader in charge.

He questions the group on last lesson's Assignment. Leader keeps record of responses.

They follow topics as follows :

Chart

1. Causes of War of 1812
2. Alien and Sedition Laws
3. Embargo Act
4. Non-Intercourse Act
5. Principal events
6. Results of war

Ten minutes : Assignment

Teacher and pupils together.

A chart is hung before group.

Chart

AIM : Monroe Doctrine

1. What is it?
2. By whom written?
3. When?

Events leading up to it

Group B

Fifteen minutes : Study

Guided by Study Chart.

Chart

AIM : To show importance of the following events :

1. Surrender at Detroit
2. Perry's victory
3. McDonough's victory
4. Attack on Baltimore and Washington
5. Battle of New Orleans
6. Treaty of peace

¹ Maguire, op. cit. p. 43.

² Ibid. p. 44.

³ Ibid. pp. 135-136.

4. Provisions
5. Instance when applied
French in Mexico
Venezuela
6. Our "big-brother" attitude
7. League of Nations

The points of the planned lesson are brought out by *teacher* and discussed, text in hand, by pupils and teacher. As each point is developed it is written as a topic on the blank chart. As a result, the chart becomes complete as above at the end of the Assignment, and it is available as a Study Chart for a guide to their following study.

Time to this point for both groups: 15 minutes
Teacher now oscillates to Group B

Fifteen minutes: Study

From text-books and reference books. Subject: Monroe Doctrine. Guided by Study Chart made in the Assignment immediately preceding.

Chart questions and topics copied into note-books, where also the answers are entered as found in texts.

Five minutes

Teacher checks Study work.

Assignment

Teacher with this group.

Five minutes for checking of Study note-books. Pupils now grouped about the teacher.

Five minutes oral recitation by individuals with criticisms of fellow pupils.

Ten minutes with teacher

Presentation of new topic: Monroe Doctrine . . . discussed as with Group A. Chart used as guide to both Assignment and Study. Copied in note-books for home study.

While this copying is done (pupils return to seats to do this) teacher is free to join Group A, and check their Study note-books.

Final five minutes of period: Both groups studying with note-books and text-books. Teacher free to assist individuals in either group

Total time of period: 40 minutes

The Morrison Plan

Of the schools reporting provisions for individual differences, according to Billett,¹ 737, or 9 per cent, stated that they were using the Morrison plan. The method is sometimes called the mastery method or the Morrison unit method. The system of instruction was applied in its embryonic stages in the public schools of Portsmouth, New Hampshire, by Henry C. Morrison, then superintendent of that school system (1899-1904). From 1904 to 1917, as state superintendent of public instruction of New Hampshire, he experimented with the idea "at different points under differing conditions and in varying fragmentary forms."² In 1919 Morrison became a member of the University of Chicago faculty and since that time has elaborated the plan in the laboratory school of that institution.

Features of the Morrison Plan

Like other originators of modes of instruction which differ from the typical, Morrison abhors the implication of inflexibility carried in the term "plan." While the system he has developed is more stable than some of the others, the beginning student should realize that new ideas are being added to the system as teachers of initiative and ingenuity apply it. Furthermore, he should learn early in his educational career that nothing in education should be permitted to become formalized. Education is a dynamic, developmental process, and its methods of procedure should have the same two vital characteristics. In broad outline Morrison's process of teaching includes the following features:

1. *The unit.* As stated in the preceding chapter, Morrison has made a valuable contribution in clarifying the unit concept. In describing one unit, "The Water Supply," he says: "The unit is a significant and important aspect of the world of well-nigh every individual who lives in civilized society. It is inclusive of the whole aspect and not a fragment."³ The unit is thus a worth-while experience, a meaningful whole, a unified portion of functional knowledge.

2. *The "mastery formula."* A definite procedure is followed with each unit. First, a pretest is given to diagnose the pupil's understanding of the content. This is followed by direct teaching and later by a test of

¹ Op. cit. p. 9.

² Henry C. Morrison, *The Practice of Teaching in the Secondary School*, p. v. The University of Chicago Press, 1926. Reprinted by permission of The University of Chicago Press.

³ Ibid. p. 172.

the results. If the pupil has not attained complete mastery, the procedure is adapted to ensure his mastery, and teaching and testing are continued. In brief the "mastery formula" is "*Pre-test, teach, test, adapt procedure, teach and test again to the point of actual learning.*"¹

3. *Adaptation.* As Morrison uses the term, an "adaptation" is a change in the pupil's life resulting from his having attained complete mastery of a unit or a portion of a unit. The mastery is not complete until a desirable change does occur. This eliminates parrot learning. Content must function in the pupil's life, must change his life in some way; otherwise actual learning does not occur.

4. *Types of teaching.* All school activities should alter the lives of pupils in desirable ways. The subject matter used for this purpose is of different types, and each type calls for its own type of procedure. The type of procedure follows from the nature of the content, and has been differentiated as follows:

a. *The science type.* The desired changes in the pupil's life in the science type of procedure are understandings of the principles "in the relation of cause and effect." This type of teaching is used for mathematics, grammar of foreign and native languages, sciences, social sciences and history, the informational content of fine and practical arts, and other courses with learning units primarily devoted to "understanding or rationalization."

b. *Appreciation type.* This type covers content which causes the pupil to place a value upon the fine arts, proper conduct, and other forms of experience which appeal to the feelings.

c. *Practical-arts type.* The desired adaptations here are manipulative skills and abilities to construct valued products. Most of the work of the practical arts is included, and also "drawing, painting and the plastic arts."

d. *The language-arts type.* This type involves the use of oral and written language rather than the mechanics of the language. It covers the ability to discourse freely, and thus includes languages, stenography, and even expression through music.

e. *Pure-practice type.* This type includes drill which requires few if any thought processes and which, when mastered, can be used almost automatically; as, for example, the combinations of addition, the multiplication table, or typing.

5. *Principles of operative technique.* By "operative technique" is meant the procedures involved in "presentations of one sort or another, the supervision of study, the testing of pupils for adaptations which the learning units contemplate, identification of pupil problems, and corrective teaching."² The following principles are involved:

¹ Ibid. p. 79.

² Ibid. p. 153.

- a. *The "learning cycle" of stimulus, assimilation, and reaction.* In all learning, the pupil is first stimulated to mental activity. Next follows a period of inner adjustments or assimilation. Eventually he reacts.
 - b. *Initial diffuse movements.* In learning any new process there is a period of fumbling, as in mastering the ability to juggle two or more balls. So in mental operations, as in arithmetic, perfection should not be expected immediately. The individual needs some time to adjust himself to the new experience and to practice its elements.
 - c. *Identification of the objectives of teaching.* The teacher and the pupil should have in mind the purposes or objectives of the unit.
 - d. *Direct teaching.* Efforts of the teacher and the pupils which attack the objective without intermediary activity are instances of direct teaching or learning, as a marooned person would learn the language of friendly natives, or as one would learn a skill by practice.
 - e. *Study.* Modes of study vary with types of teaching; in each type the student should be trained to study in the way best suited to that type.
 - f. *Apperceptive mass.* The sum total of one's previous experience is his apperceptive mass at any given time. Connections with this mass should be made at the outset of each unit by relating the new with the old experiences.
6. *The teaching cycle.* The teaching cycle of the Morrison plan was described in the preceding chapter, where it was compared with the five Herbartian steps. It includes these five steps: exploration, presentation, assimilation, organization, and recitation.

Concluding Statement

Eight applications of the unit idea have been presented in brief outline: the problem method, the project method, the activity movement, the Winnetka system, the Dalton system, the Miller contract plan, the group-study plan, and the Morrison system. The original sources of the plans are almost identical; yet the applications have been made independently, and each contains original elements resulting from the creativeness of its originator. No student will be content to use any one plan in its entirety; instead he will develop his own system as a composite of all that he considers valuable in earlier systems plus new ideas which he himself will develop.

A ninth application of the unit idea, the workbook, will be discussed in the next chapter.

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CHAPTER VIII • The Workbook in Secondary School Teaching

GENERAL VIEW OF THE CHAPTER

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Origin and Spread of the Workbook Idea

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The Purpose of the Chapter

Few, if any, educational devices have ever received such rapid and widespread acceptance in America as the workbook has since 1915. Data are not available to show the growth in objective terms, but it is well known that the increase in the use of this modern teaching and learning device has been phenomenal. In a survey of two hundred and twenty school systems which were using the device in 1931, it was revealed that 47 per cent of the schools were using workbooks in four or more different subjects, while 9 per cent were using them in eight or nine different subjects.¹ The prospective teacher might well ask, Whence came the idea, what forms has it taken, what are the values and limitations of the device, what features does it contain, and how may it be used most effectively? The purpose of this chapter is to answer these queries and others which have arisen in various teacher groups and college classes during discussions of the workbook and its use.

Origin and Spread of the Workbook Idea

The workbook is a development of the written assignment. As a teaching procedure the written assignment antedates the workbook of today by a century at least, and probably much longer. Doing "sums" in

¹ T. V. Goodrich, "Is the Workbook a Necessity or a Luxury?" *School Executives Magazine* (April, 1931), 50: 359-361.

arithmetic from instructions written on slate, paper, or blackboard, for example, has long been a practice in schools. Before the end of the nineteenth century, study sheets in science had been developed by J. T. Draper as the basis of individualized instruction. These "sheets of suggestions" gave for each subject in science "a few basic directions, a large number of references, but unlimited opportunity for personal discoveries."¹

It was not until the second decade of the twentieth century, however, that the idea was developed systematically for an entire school program. This development occurred under the direction of Frederic Burk, president of the San Francisco State Normal School, beginning in 1912. "His 'self-instruction bulletins' spread all over the United States and to many foreign countries until a ruling of the California attorney general stopped their publication."² The bulletins were essentially textbooks, written by the teachers themselves with a view to their being "fundamentally self-instructive." They covered arithmetic, geography, grammar, history, language, and phonics. By 1915 the experimental work with these exercise books and other features of individualized instruction had been proved successful in terms of more rapid pupil progress, "elimination of wastes of school time, and actual saving in cost of schooling."³ Since that time the influence of the idea has spread to almost all secondary-school subjects and has been adopted by a large majority of the schools in America. The study by Goodrich⁴ revealed that nine tenths of the two hundred and forty-five schools studied by him were using workbooks and that one publishing house had issued seventy different workbooks, one series of which was being used by four thousand cities. The writer's incomplete files contain more than two hundred different workbooks covering secondary-school fields.

Types of Instructional Booklets

If one were to include under the term "workbook" all printed and bound instructional materials to be placed in the hands of pupils, excluding only texts and reference works, he would find a wide array of devices. Such devices may be classified into several rather distinct types as follows:

¹ Preston W. Search, *An Ideal School*, p. 201. D. Appleton-Century Company, Inc., 1903.

² Carleton Washburne (chairman), "Adapting Schools to Individual Differences," *The Twenty-fourth Yearbook of the National Society for the Study of Education, Part II*, p. 59. Public School Publishing Company, 1925. Quoted by permission of the Society.

³ Frederic L. Burk, *In Re: Everychild, a Minor, vs. Lockstep Schooling, a Suit in Equity*, Monograph C. San Francisco State Normal School, 1915.

⁴ Op. cit. p. 351.

1. Tablets of practice exercises, achievement tests, diagnostic tests, or other single instructional devices.
2. Old-style science laboratory manuals.
3. Outlined units of content, with detailed directions and numerous instructional aids.
 - a. Designed to parallel a specified textbook.
 - b. Designed to cover a given field without paralleling any one textbook.

Types 1 and 2 are not included under the term "workbook" as it is used in this chapter. Each instructional booklet of the first type is restricted to only one feature of the workbook, while the laboratory manuals of earlier days are excluded because of their routinized procedures and because they lack many essential elements of a modern workbook. The instructional booklet of the third type is truly a workbook. It is to this type that the following discussions apply except when other types are specifically mentioned.

Values of the Workbook

Since some workbooks do not contain all the desirable features of the workbook idea, the values of any given workbook will obviously depend upon the features that it contains. The values listed below have been drawn from an inspection of more than two hundred samples and have been supplemented by contributions from teachers of experience in the use of workbooks. It is entirely possible that a workbook might be constructed to include all the values indicated.

The student may have three purposes in mind in studying the following list: (1) to understand the values of workbooks; (2) to become able to select workbooks for courses; (3) to get suggestions for constructing his own workbooks. The values of the workbook are as follows:

Emphasis upon Objectives

At the outset of a unit in a workbook a clear statement of the purposes to be achieved by the unit should be set forth. Spaces should be available for additional objectives of individual pupils or for those which may arise from group discussion. All exercises should be framed as evident contributions to the announced objectives. The final section of the unit should make provision for an appraisal of the unit's contribution to the objectives. These procedures will keep the pupil's attention focused upon the aims of his activities and thereby give him perspective as he works.

Stimulation of Interest

The setting of objectives in itself motivates pupils to activity. Some of the other stimulating influences of the workbook are the measurement devices, the timed drills, the provisions for immediate attack upon a problem, the replacement of laborious copying of instructions, and the progress graphs. Goodrich¹ received fifteen affirmative answers for each negative answer to the question "Do pupils enjoy the work set out for them in workbooks and take pride in doing it well?"

Organization of Work

The workbook aids in organization of work in two ways. In the first place, it organizes the content of the course into units; in the second place, it organizes the student's study program for the unit.

Comprehensive View of a Course

By outlining the units of a course a well-constructed workbook gives the pupil a bird's-eye view of a semester's work or a year's work. Some workbooks go farther in this direction by devoting a part of the first unit to orienting the student to the entire course. The student thereby not only gains a better appreciation of the whole field but also appreciates the significance of each unit in its relation to the total.

Proper Distribution of Content

A workbook is more flexible than the usual textbook and therefore can more easily be made to fit varying conditions. To some degree, consequently, it affords better than the basic text the opportunity to redistribute the content of a course in terms of the pupils' abilities and interests, the local community needs, the teacher's judgments, or other factors.

Emphasis upon, and Mastery of, Core Subject Matter

The minimum essentials of content which should be mastered by all pupils are usually included in the learning exercises and in the pretests or diagnostic tests carried in the workbook. A check upon such basic subject matter is used as the starting point for differentiated work along lines of individual interests and abilities. Thus a mastery of the fundamental content by each pupil is assured in a workbook that is well constructed.

¹ Op. cit. p. 351.

Supplementary Material

Within the workbook itself, aside from the references to other sources which it contains also, there is frequently supplementary material of interest to pupils. This is often in the form of statistics, graphs, charts, maps, cartoons, pictures, or other illustrative material, in addition to references to books of interest to pupils. Such information is not only supplementary to the text but highly motivating as well.

Application of Textbook Information

The type of workbook which is built to parallel a given textbook often stresses learning exercises designed to apply the information carried in the text. Other types of workbooks care for the application step of the unit by suggesting everyday situations to which basic information of the course may be applied. This feature simplifies the teacher's task and guarantees the fulfillment of the most significant and most often neglected step in the learning process, namely, the application of the knowledge to life situations.

Systematized Collateral Work

The carefully selected references listed with each unit save both teacher and pupil much time which they would otherwise spend in seeking appropriate reference materials. The workbook also specifies other types of collateral work, such as special problems, experiments, trips, and similar activities, and systematically links them with the work of the unit.

Stimulation of Independent Thinking

Many activities listed for work beyond the minimum essentials challenge the ability of the most capable and stimulate them to creative work. Special projects carried out by them become incentives for the less able to put forth their best efforts at original work. The pupil also learns to study problems from the instructions carried in the workbook and thus becomes more and more independent of the teacher. This is a very desirable type of independence and should lead to greater freedom in learning.

Provision of Audience Situations

The usual classroom opportunities for pupils to speak to audiences are supplemented by many workbooks in their provisions for special reports, demonstrations, dramatizations, debates, and in other similar learning exercises.

Aid to Appreciation

Some workbooks carry exercises designed to aid the pupil in his appreciation of science, literature, fine arts, and social studies. This value of workbooks is less frequently realized than most of the other values because less attention has been given it in the construction of learning exercises.

Pretests

The pretests provided in workbooks enable the teacher at the outset of a unit to ascertain what the pupils already know of the content to be covered. The teacher is then in position to direct the study of each pupil from the point where his knowledge ends.

Directed Learning

The written instructions to students, the prescribed learning exercises, the carefully selected and specific references, and other features of the workbook constitute the best type of directed learning. The student is often able to pursue his work with little or no help from the teacher.

Aid to Assignment

This value is implied in the one just mentioned. Often the workbook instructions are the *entire* assignment. At all times the directions printed in the workbooks obviate the need for writing assignments on the blackboard or in notebooks. Another value is the assurance the teacher has that each pupil understands the assignment.

Provision for Individual Differences

This is one of the chief values of the workbook idea. Exercises are included which call for all ranges of ability from the very dull to the near genius. Choice is afforded each pupil to pursue those exercises which challenge him after the pretest has indicated where he should begin. The teacher should direct the activity at this point to prevent the less able from selecting projects beyond their ability and, if necessary, to stimulate the abler pupils to their best activity.

Opportunity for Each Pupil to Proceed at His Own Rate

Rate of work is another aspect of individual differences. Sometimes classroom or general school regulations make it impossible for each pupil to realize the opportunity a well-constructed workbook offers him to

proceed at his own rate. This is a limitation of the school program, except when a child would be injured by too rapid promotion. For such a child the workbook offers a wealth of enrichment which leads him deeper into the subjects of study or into enticing side journeys. Each child has the right to progress slowly or rapidly in accordance with his ability. The traditional artificial restrictions should be removed to give him this opportunity in subjects in which group work is not essential, and the workbook is available as an instrument with which the progress may be made.

Self-evaluation

Accompanying the means for individual progress are the devices for self-check of that progress. These include the tests designed for self-direction, timed drills, illustrations of correct procedures, and specific instructions pertaining to each step.

Convenient Record of Achievement

The progress chart carried in the workbook gives the teacher, at a glance, the standing of the pupil. In the absence of a progress chart an inspection of work completed supplies similar information to the teacher. A related value is the assurance given the teacher that each pupil is actually making progress. It is extremely difficult for the loafer to "get by" when the workbook is being used.

Objective Basis for Remedial Teaching

Diagnostic tests and exercises are included within the covers of many workbooks and accompany others under separate covers. Often the pre-test is a critically diagnostic instrument; in other cases the diagnostic test follows the study of some particularly intricate portion of the unit; in still other cases the final test of the unit is diagnostic. In any case the results of the test form the basis for careful instruction over the portions missed, with a view to perfecting the pupil's mastery of the content.

Objective Basis for Marking

Until the educational world completely eliminates the system of marking, which, let us hope, will be in the near future, some impersonal method of assigning marks will continue to be necessary. Two features of the workbook afford such an objective basis: first, the scores on the objective tests; secondly, the written work prepared according to specified stand-

ards. The latter is less objective than the former, but some workbooks contain successful means for making the written work commensurable.

Saving the Teacher's Time

Several of the foregoing paragraphs have implied that the workbook releases the teacher from many purely clerical tasks of the typical classroom. The self-checking devices place the responsibility upon the pupil; the printed instructions reduce the amount of blackboard assignment and dictation (no time is wasted on the child who "forgot what the assignment was," because there is no chance to forget); the carefully selected references reduce the library work of the teacher and leave only the task of keeping the references up to date; much time is saved in the planning of instruction. Harrington and Lippert,¹ in their reports from forty-five teachers, sixty-three administrative officers, and twenty-four colleges of education, found 58 per cent agreement that the workbook economizes time and 53 per cent agreement that it "provides a more efficient teaching organization." All time thus saved can be devoted to individual instruction or to other activities of value to the pupil and the group.

Saving the Pupil's Time

Reference has been made to the elimination of the need for the pupil to copy assignments from the blackboard or from the teacher's dictation. In addition to these minutes are those which without the workbook are lost in trying to remember the specific points of the assignment or in asking associates or the teacher about points not accurately copied. The instructions enable the pupil to correct his own work instead of waiting his turn with the teacher, which is of double value, because the correcting itself is educational. Again, the clear-cut assignments reduce the amount of fumbling at the outset.

In addition to the several features which save minutes for the pupil, there are two larger aspects of time-saving made possible by the workbook. In the first place, the bright pupil is not held back by the dull. Consequently, in systems permitting individual progress, he may save one or even two years. In the second place, more rapid progress than is possible in the typical school is made by all pupils when the workbook is associated with individual and subject promotion. On this point Burk² gives evidence to support the following statement:

¹ Ellen E. Harrington and Dorothy E. Lippert, "Workbook: What Do People in the Teaching Profession Think of It?" *Pennsylvania School Journal* (March, 1934), 82: 359-362.

² Op. cit. p. 3.

I. THE RATE OF PROGRESS. That the slowest pupils, in normal health of body and mind, will complete the usual eight grades of elementary school in not more than seven years; that the fastest will finish in not more than five years; that between these extremes, the rates are very evenly distributed; that, in consequence, pupils who enter school at 6 years of age will complete the eight grades between the ages of 10 and 13 years.

The more recent study of the Winnetka system revealed similar results :

14.4% of the Winnetka children were retarded while 22.6% of the children from the other schools were retarded.¹

More striking than the reduction in the number of pupils who repeat grades were the results in achievement. Even though less time was spent in a grade, on the average, "the lines representing Winnetka are above the lines representing the general average far more often than below it."² Tests were made also to compare the Winnetka children with those from two other near-by schools after they had entered the ninth grade of the same township high school, where the Winnetka children were at the disadvantage of changing their mode of study from the individual to the class basis.

A comparative study of the high school freshmen from Winnetka and those of these other communities shows that Winnetka freshmen have made a better record in three out of four major subjects and in an average of all subjects than have those of the other communities.³

These findings indicate that the pupil's time is saved without jeopardizing his learning; in fact, they also suggest that his learning and retention are better. The results of controlled experiments by Hurd likewise were favorable to the workbook.⁴

Saving Money

Burk's and Washburne's studies show that, on the average, when the workbook idea is used as the basis for individual progress, pupils complete their elementary school in less than the normal time. In schools in which pupils have their programs enriched instead of being permitted to advance more rapidly an equivalent value is achieved. In the one case the expense

¹ Carleton Washburne, Mabel Vogel, and William S. Gray, *A Survey of the Winnetka Public Schools*, p. 29. Public School Publishing Company, 1926.

² Ibid. p. 77.

³ Ibid. p. 81.

⁴ A. W. Hurd, "The Workbook as an Instructional Aid," *The School Review* (October, 1931), 39: 608-616.

is reduced by cutting down the elementary period ; in the other case more training is obtained for a given expenditure of money. In either case the value derived more than offsets the cost of the workbooks and thus is equivalent to a saving in dollars for the amount of training given.

Limitations of the Workbook

Any given workbook is obviously limited in its use to the features it contains. Also, any poorly constructed features in a given workbook will result in unsuccessful application of the practice it proposes. In general, therefore, it may be said that the success of the workbook idea depends entirely upon the number and quality of the features carried in the workbooks for the various subjects. Some of the following limitations are of the types in which some important feature is missing or poorly executed ; others are more widely applicable to the workbook idea itself, although some of these limitations may be charged in part to the teacher. The limitations listed here resulted from classroom discussions of students in education who had had as teachers considerable experience in the use of workbooks.

Overuse

Some teachers are inclined to use the workbook to the exclusion of too many other important procedures. In a school in which the workbook is the basis for individual progress, there should be opportunity for socializing procedures. In other types of schools the workbook should not crowd out such procedures as group projects and socialized recitations. Overuse, however, not only limits pupil development but also leads to the deterioration of the teacher who relies too greatly upon the instrument. The teacher should not become a slave to the workbook ; instead he should be on the alert at all times to modify it whenever necessary and to supplement it with other worth-while procedures.

Mechanized Learning

This undesirable outcome is not an inevitable result of the workbook. There is nothing inherent in the workbook which must necessarily result in stereotyped learning. It is only when the teacher becomes a slave to the workbook that learning becomes a mechanized, lifeless process. The teacher with initiative will prevent such a result by vitalizing and socializing the learning procedures of the group.

Restriction of Independent Thinking

This criticism of the workbook idea, though sometimes made, is not valid. Wrong use of the workbook might thwart the pupil, but a well-constructed workbook in the hands of a competent teacher becomes an instrument which promotes independent work by pupils. Instead of being a substitute for thinking and planning, it becomes a challenge for better thinking and pupil development.

Weaknesses of Certain Workbooks

Any workbook which fails to provide a certain value which it might provide is weak in that respect. Thus some may ignore creative work, others may not cover the material adequately, and still others may not include diagnostic tests or self-checking devices, and so forth. These are not inherent weaknesses of the idea, but are oversights by the authors of the workbooks. Some workbooks may not be well fitted to the grade in which they are being used; others may be too independent of the text. Here again the fault does not rest in the idea of the workbook, but instead may be charged to the author who made the workbook or to the teacher who selected the one which did not fit his class and later failed to make the necessary adjustments.

Limited Library Facilities

Most workbooks carry rather complete references to the more important books in the field at the level of the content covered. Many small schools, when they adopt workbooks, find that their library facilities are inadequate. This is a handicap to the use of the workbook rather than a limitation of the workbook itself. This difficulty should be eliminated by proper additions to the library.

Immediate Cost

The average cost of workbooks per pupil in schools committed to the idea is about a dollar a year, according to Goodrich.¹ Since most workbooks are consumed in use, the outlay must be repeated each year without refund for used copies. This adds a considerable amount to the school budget or to the pupil's expense if he supplies his own books; but as shown above, the immediate cost is more than justified by more rapid pupil progress and decreased retardation.

¹ Op. cit. p. 359.

Devices Carried in Workbooks and in Other Instructional Booklets

An analysis of two hundred and one instructional booklets from the writer's files revealed a wide assortment of study devices and aids. While all the samples analyzed were applications of the workbook idea and were called workbooks, only a few more than half of them would qualify as workbooks under the definition of Type 3 given on page 184.

For convenience in reporting the results of the analysis the devices have been grouped under four headings: (1) specific study aids; (2) graphic presentations; (3) drill materials and other learning exercises; (4) testing materials. The accompanying tables give the frequencies with which the devices were found for the secondary-school subjects specified in the tabulations. Throughout the discussion the term "workbook" will be used to designate all types of booklets inspected.

Specific Study Aids (See Table 6)

Approximately a third of the workbooks carried introductory remarks intended to link the new unit or problem with the pupil's previous knowledge or experience and to create interest in the new work.

Objectives were clearly set forth in 9.5 per cent of the workbooks analyzed. In others the objectives were implied in the title of the unit or in the instructions to students.

TABLE 6. SPECIFIC STUDY AIDS CARRIED IN 201 SECONDARY-SCHOOL INSTRUCTIONAL BOOKLETS OF ALL TYPES

	<i>English</i>	<i>Foreign Language</i>	<i>History</i>	<i>Mathematics</i>	<i>Natural Science</i>	<i>Social Studies</i>	<i>Total</i>	
	77 ¹	14	29	45	20	16	201	
							Number	Per Cent
Introductory remarks . .	33	1	15	4	8	7	68	34.0
Objectives	8	0	6	0	5	0	19	9.5
Instructions to students .	42	11	20	30	11	13	127	63.5
Self-instructive devices .	58	6	8	16	8	9	105	52.5
Self-corrective material .	2	0	0	0	0	0	2	1.0
Textbook references . . .	5	0	10	0	10	4	29	14.5
Reading lists	1	0	11	0	5	7	24	12.0
Provision for choice of work (Separate directions to teachers).	0	0	11	0	5	0	16	8.0
	34	7	9	17	5	7	79	39.5

¹ The number of workbooks inspected.

Some workbooks left the matter of specific instructions entirely in the hands of the teacher, more than a third carrying special instructions to the teacher. Others gave some, but limited, attention to the problem. On the other hand, more than half carried detailed instructions intended to enable the pupil to progress at his own rate with a minimum of aid from the teacher.

Self-instructive devices constituted a feature of approximately half the workbooks. They consisted of practice exercises on new material, drills on materials already learned, exercises with specific instructions for the application of knowledge to practical situations, and so forth. According to Table 6 this feature was carried in a larger percentage of the English workbooks than of those for other subjects.

From the tabulation it is very evident that this Winnetka technique, self-corrective material, has not yet found an important place in current workbooks. This feature should be included in all workbooks to which it could apply. The habit of checking oneself should be formed by all secondary-school pupils.

Textbook references and reading lists were found in only a ninth of the books inspected. Their low frequency in the English group is explained by the fact that a large percentage of the English workbooks carried the entire content they were built to cover. Another explanation for the low frequency may be found in the fact that many of the booklets analyzed were largely exercise and drill books instead of complete workbooks. Any well-constructed workbook which does not carry all needed content should give specific references to several basic reference works in the field.

Provision for choice of work was made in only 8 per cent of the books inspected. A workbook, in addition to covering the essentials, should give leads to further study in the form of projects or problems as optional work for students able to perform them.

Graphic Presentations (See Table 7)

One or more workbooks for each subject shown in Table 7, except foreign languages, included graphs in their devices, the frequency of use being greatest in mathematics. Maps were found in approximately a sixth of the workbooks, including those in English, foreign languages, and natural science as well as those in history and social studies.

Diagrams were used in workbooks for all subjects, and charts were found in all except those for foreign languages. Both were found more frequently than either graphs or maps.

TABLE 7. GRAPHIC PRESENTATIONS CARRIED IN 201 SECONDARY-SCHOOL INSTRUCTIONAL BOOKLETS OF ALL TYPES

	English	Foreign Language	History	Mathematics	Natural Science	Social Studies	Total	
	77 ¹	14	29	45	20	16	201	
							Number	Per Cent
Graphs	1	0	4	22	4	5	35	17.5
Maps	5	3	23	0	2	10	43	21.5
Diagrams	9	6	4	28	10	9	66	33.0
Charts	4	0	15	13	4	8	46	23.0

Drill Materials and Other Learning Exercises (See Table 8)

Specific plans for review were outlined in a fifth of the workbooks, and drills of various types were included in more than three fourths. Timed drills were almost entirely limited to mathematics.

The rather limited frequencies of problems and projects revealed in Table 8 resulted from the fact that many of the booklets, though called workbooks, were exercise and drill pads rather than complete workbooks. Challenging problems and projects should be included in every workbook.

TABLE 8. DRILL MATERIALS AND OTHER LEARNING EXERCISES CARRIED IN 201 SECONDARY-SCHOOL INSTRUCTIONAL BOOKLETS OF ALL TYPES

	English	Foreign Language	History	Mathematics	Natural Science	Social Studies	Total	
	77 ¹	14	29	45	20	16	201	
							Number	Per Cent
Organized review	14	2	11	10	6	3	46	23.0
Vocabulary drills	22	14	9	7	3	4	59	29.5
Timed drills	0	0	1	12	1	0	14	7.0
Other drill material . . .	41	12	13	30	4	4	104	52.0
Problems	23	0	16	9	10	4	62	31.0
Projects	1	0	10	6	7	3	27	13.5

Testing Materials (See Table 9)

Approximately half the workbooks carried testing material of some type. Self-testing was featured in more than a fifth of the samples. Purely diagnostic tests rarely appeared, and pretests were too infrequently used. Almost all the tests were of the objective type.

¹ The number of workbooks inspected.

TABLE 9. TESTING MATERIALS CARRIED IN 201 SECONDARY-SCHOOL INSTRUCTIONAL BOOKLETS OF ALL TYPES

	<i>English</i>	<i>Foreign Language</i>	<i>History</i>	<i>Mathe- matics</i>	<i>Natural Science</i>	<i>Social Studies</i>	<i>Total</i>	
	77 ¹	14	29	45	20	16	201	
							Num- ber	Per Cent
Achievement tests	14	3	15	21	6	3	62	31.0
Self-testing exercises . . .	16	5	7	9	6	1	44	22.0
Pretests	7	0	1	1	3	0	12	6.0
Diagnostic tests	2	0	0	3	0	0	5	2.5

A Rating Chart for Workbooks

The chart presented on pages 197 and 198 has been constructed more or less arbitrarily, although some consideration has been given to current practice. The outline provides a means for checking workbooks already in use. A more important use is the set of standards suggested to the student in education who may eventually construct workbooks for use in his own classes.

In the application of the chart to any given workbook one should consider the nature of the field, to avoid lowering the score for omission of features not applicable to the subject. Appropriate reduction of the number of possible points for each subdivision should be made whenever a feature applicable to the content is not contained in the workbook or, if contained, is not adequately presented. This leaves much room for personal judgment. The chart is not presented as a thoroughly objective device but is intended to offer suggestions, especially to the teacher preparing workbook units for his own classes.

Varying Practices in the Use of Workbooks

At certain points in the foregoing discussion it has been implied that the use made of workbooks varies with schools or even with teachers within the same school. The question which now arises is What are the various methods of using workbooks? In answer to that question, this final section of the chapter describes four main practices of schools or teachers in the use of workbooks.

¹ The number of workbooks inspected.

WORKBOOK RATING CHART

<i>Feature</i>	<i>Standard</i>	<i>Possible Points</i>
I. Construction	The workbook should be made of pliable, durable, yet inexpensive material and be firmly bound. The preferred size is 8½ by 11 inches	5
II. Typography	The printing type should be ten-point or larger. Logical arrangements should be emphasized by varying styles and sizes of type, by indentations, and by numbering and lettering the outlines. The form should be well balanced and attractive, but not elaborate. The workmanship should be perfect	5
III. Subject matter		
A. Organization	The subject matter should be organized in real units, "meaningful wholes." The sequence of the units should be such that when the work is completed the pupil will have a grasp of the entire course	10
B. Scope	The minimum essentials for the grade should be covered either by reference to text or other sources or by inclusion in the workbook. In addition, there should be ample opportunity for extended study to the limit of the pupil's ability and time	5
C. Nature.	(1) Much but not all of the material should be drawn from reliable printed sources. (2) Experiences of the pupils should be used as much as practicable. (3) Opportunity for contributions from the teacher should be provided. (4) Provision for the inclusion of periodical material should be made	10
IV. Provisions for individual differences	(1) The workbook should be devised to permit each pupil to progress at his own rate and should contain the mechanics for the administration of such a plan. (2) It should contain materials which call for a range of ability found in a typical group in the subject; namely, material simple enough not to discourage the weakest and other material which will challenge the ablest. (3) Ample enrichment should be provided for those who for social reasons should not be promoted ahead of their group	20

<i>Feature</i>	<i>Standard</i>	<i>Possible Points</i>
V. Devices and procedures		
A. Specific study aids . . .	Each unit in the workbook should contain (1) a clear statement of objectives; (2) an introductory paragraph or the equivalent, to establish "apperceptive sequence" and to motivate; (3) complete instructions to students; (4) self-instructive arrangements; (5) self-corrective material wherever possible; (6) textbook reference if a given text is being followed; (7) specific references to standard works; (8) provisions for optional work	20
B. Graphic presentations .	All units in which such devices would be practicable should include one or more of the following: (1) graphs, (2) maps, (3) diagrams, (4) charts, (5) pictures	5
C. Drill and other learning exercises	(1) An appropriate amount of drill for the content should be included in each unit containing material for which drill is essential. Where feasible the drills should be timed. They should be self-corrective, and space should be provided for records. (2) In each unit some of the exercises should be stated as problems, and others should be stated as individual or group projects.	10
D. Testing materials . . .	All testing materials should be of the objective type. Keys should be included, and space provided for the pupil's record on each unit. The material should include pretests and achievement tests; both should be diagnostic and should be accompanied by remedial procedures.	10
<i>Total points</i>	100

Supplementary Work

Some schools or teachers do not look upon the workbook as one of the main instruments of instruction, but instead consider it supplementary to the program of instruction. In such cases the workbooks, whether purchased by the school or by the pupil, are kept in a cabinet in the classroom or upon the teacher's desk. Sometimes they are distributed in accordance with the teacher's plans, permitting all pupils to work upon the supplementary assignment on the page in the workbook specified by the teacher, after which the workbooks are collected and checked by

the teacher during leisure time. Other teachers have the understanding with their classes that a pupil may use his workbook after he has completed a specified amount of regular work, and they permit a pupil to get his workbook from the desk when he is ready for the supplementary work.

The supplementary work may consist of practice exercises, speed drills, reviews, individual or group projects, other types of enrichment, or any other instructional device contained in the workbooks, and it is selected and assigned by the teacher.

This usage of the workbook has some values, but at best it is only a halfhearted application of the workbook idea and is not recommended for general practice.

A Main Basis for Classwork

Other schools place the workbook on a par with the textbook, and still others place it above the textbook as a source for classwork. These schools retain the traditional class system, in which pupils are promoted by groups instead of as individuals. Usually the pupil keeps his workbook in his own desk and uses it in the preparation of his schoolwork, following its instructions. He receives little or much guidance from the teacher, according to the teacher's or the school's policy in this regard. Usually all pupils work on a unit at the same time, and it becomes the basis of class discussions and reports. When one unit is finished, all pupils are tested, and all then proceed to the next unit.

From this usage are derived practically all the values of the workbook discussed earlier in this chapter except that of individual promotion. The workbook, in this practice, becomes the written assignment for the entire class, and each pupil studies according to his ability. Optional work leads some into enrichments for which the less able cannot find time. The textbook and other references are followed, and the essentials are mastered by all before the class leaves the unit.

The Chief Basis for Individual Promotion

In the complete or modified Winnetka and Dalton schools some form of the workbook idea is used as the basis for individual promotion. In these schools, as explained in an earlier chapter, a child proceeds as rapidly as he completes the units, regardless of the progress of other pupils.

When this practice is properly supplemented by desirable group activities, it has several real advantages over the typical classroom procedure in American secondary schools. No pupil fails; the less able simply

do not proceed as rapidly as the more capable. The superior pupil is not restrained by the inferior. The more able pupil is permitted to complete his secondary-school subjects in less time than under the typical plan.

However, there are certain types of subject matter which should be studied by groups rather than by individuals. In general all subject matter intended to develop emotionalized attitudes, in part from the content itself but *also in part from group discussion of the content*, would fall under these types. It is doubtful whether, in our present stage of educational development, such subject matter operates as effectively in the lives of pupils when learned individually as when learned in groups.

In dealing with subject matter of all other types the secondary schools have been entirely too slow in adopting individualized instruction based upon the workbook idea.

As a Basis for Pupil Participation in the Development of Instructional Materials

This idea is essentially that of the Miller contract plan, in which the pupils and the teacher work together in the development of a unit. They co-operate in setting up purposes, in listing learning exercises, in seeking reference materials, even in building tests, and in all other procedures involved in building a unit. Pupils study and discuss problems at various stages in the construction of the unit. Often by the time the unit has been constructed the pupils have mastered its content. In such cases the written unit becomes a record of work done instead of being an assignment of tasks to be performed. The completed units are usable for review and as starting points for subsequent groups.

Pupil participation of this kind is exceedingly valuable for the types of subject matter in which emotionalized attitudes are developed largely from group discussion of the content of the course and for the types of subject matter which are less adapted to individual progress. This more liberal practice might well be used for content which should be developed and emotionalized by groups, while the standard workbook is being used for all other content.

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CHAPTER IX · Integration and Elaboration of the Unit Procedures

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Purpose of the Chapter

THE three foregoing chapters of this division have dealt with the unit concept in teaching and learning. The origin and growth of the concept have been traced. The features of eight applications of the idea have been analyzed. A ninth application, the workbook, has been treated in detail. The present chapter co-ordinates the best features which have been refined by use in the various plans and adds others which have arisen from reflective consideration, by many persons, of the earlier applications of the unit idea. The resulting composite plan should have at least two advantages over those from which in large part it is derived. In the first place, it consists of the features which have successfully stood the test of

experience; and in the second place, it is not burdened with the practices which had been discarded as less valuable by users of the earlier schemes. Also, much valuable information about current practices in unit plans has been made available for consideration and use by the report of Billett.¹

The following outline of instructional procedures is thus a practicable scheme of the best practice for the progressive public secondary school. It calls for some adjustments from the traditional viewpoint to the modern in educational thinking, yet it is not too radical a departure to be applied in any secondary school. Inasmuch as the techniques have been derived in the main from past and current practices, it is obvious that many of the elements of the composite plan are being used daily in numerous secondary schools.

The Plan in Broad Outline

In its broad outline the integrated plan follows the natural order of learning first systematized by Herbart and later elaborated, especially under the problem, the project, and the Morrison plans. At the outset of any learning activity comes a period of adjusting one's mind to the situation and of making an initial attack. This period, in the present plan, is called Introduction and Attack. On a unit requiring three weeks two or three days would be required for the introduction and attack by a group; perhaps less time if an individual progress system is in operation. In general the time required for this stage will depend upon the pupils' previous knowledge or experience.

After the initial attack comes an extended period of investigation, selection of information, reading, and deliberation. This stage of the process has been labeled Study and Work. At times during this phase of the unit pupils will work in groups; at other times they will proceed individually. On the average about 60 per cent of the time required for a unit should be devoted to the study-and-work period; thus the period would cover about nine days in a unit requiring three weeks in a school with the class system. It would cover still more of the time under a plan of individual progress, perhaps as much as 85 per cent.

At the end of the study-and-work stage the pupil is ready to integrate, organize, and apply the information or experiences he has covered. Here

¹ Roy O. Billett, *Provisions for Individual Differences, Marking, and Promotion*, National Survey of Secondary Education, Office of Education Bulletin, 1932, No. 17, Monograph No. 13. United States Government Printing Office. 1933.

again the procedure may be carried on by groups or individually. The third stage of the learning process is here called Integration and Application and should require on the average about 20 or 25 per cent of the time devoted to a unit.

Finally, the student should appraise the outcome of the unit in terms of values received and should measure his subject-matter accomplishment with a standardized objective test or other instrument of measurement. This stage, called Appraisal of Outcome, will usually require about 5 per cent of the total time devoted to the unit. If at this stage the student finds the results unsatisfactory, the time of the unit should be extended and the earlier processes repeated.

It should be specifically noted that this procedure would largely eliminate the daily recitation. The integration period might well be similar to the socialized recitation in a school conducted on a class basis, but during the other three fourths or four fifths of the time the pupils would be engaged in forms of activity other than reciting lessons. The daily recitation is no longer the most effective educational practice; it must give way to more desirable learning procedures.

The remainder of this chapter will set forth the purposes of each of the four stages in the process, describe their procedures, and present illustrations from current practice. The teacher's part in the construction and use of the devices described below and his relation to other procedures which may be applied to this general plan of instruction will be discussed in the six chapters of Division III.

Introduction and Attack

The outcome of the entire learning process in any unit depends largely upon the success of its initial stage. Consequently a detailed analysis of the purposes and techniques of this introductory period is presented in this section.

Purposes

The purposes of the initial stage vary somewhat with the subject or unit. In general they should include the following:

1. To give the pupil a clear understanding of the problem or the learning situation.
2. To ascertain the pupil's previous knowledge of the content to be covered.
3. To discover the pupil's chief needs with reference to the unit.

4. To link the pupil's past experience and his interests to the unit.
5. To give an overview of the entire unit.
6. To set definite objectives to be attained.
7. To arouse new interests in the unit.
8. To lay a definite plan, understood by each pupil, for beginning the study and work on the unit.
9. To locate pupils needing special help.
10. To assemble the materials of study needed for the unit.
11. To make a definite start on the study program.

The purposes should be achieved in approximately the same order as that given above. Unless a pupil understands clearly at the outset the nature of the unit, it will become for him a tedious task. Time devoted to clearing up points in this connection is well spent. As this purpose is achieved, the pupil will be able to recall related information. At this point a pretest should definitely ascertain what he knows of the problem or unit.

The personal data about the pupil discussed in an earlier chapter will be valuable in achieving purposes 3 and 4. The teacher should study the pupil's record to ascertain specific needs which might be met by the unit, and he should lay plans for drawing out the pupil's recorded experiences and interests as the unit develops.

Purposes 5 and 6 may be achieved simultaneously. As the group discusses the main outline of the unit, the pupils and the teacher together should define the goals or objectives to be attained. If the objectives are printed, as in a workbook, they should be weighed and accepted or rejected; additions should usually be made.

The group should work out specific plans for the initial attack upon the problem and with the aid of the teacher should assemble the references and other instructional materials. While these purposes are being achieved, interest will develop with most of the pupils and the teacher will have opportunity to locate pupils who require special help or stimulation.

A final purpose of the introduction-and-attack stage is to make sure that each pupil actually begins his part of the plan of work.

In schools where there are no class groups for certain subjects the workbook or other idea upon which individual progress is based should be constructed to achieve these same purposes as the pupil enters a new unit.

Techniques or Procedures

Some of the techniques of the introduction-and-attack stage have been implied in the discussion of purposes. A unit may be launched successfully by the use of some or all of the following procedures:

1. Inspection of pupils' records to determine abilities, needs, interests, and experiences related to the unit.
2. Statement by the teacher of the general purpose of the unit.
3. Presentation by the teacher of a general overview of the content in story form, in a chalk talk, or in a more formal manner.
4. Showing of a film to give general introduction to the unit.
5. Listening to related topics over the radio.
6. Group determination of goals to be achieved.
7. Oral questioning and informal class discussion.
8. Outlining of the methods by which the pupil is to study the unit.
9. Relation of new unit to previously mastered ideas or facts through questions, suggestions, or explanations by the teacher.
10. A written objective pretest to determine what the pupil already knows.
11. Distribution of assignments, units, and problems in multigraphed, mimeographed, or printed form.
12. Suggestion of hypotheses for the solution of problems involved.
13. Written test to determine the extent to which pupils have secured an accurate overview.
14. Repetition of introductory step for those who do not pass the test satisfactorily.
15. Building a plan of action.
16. Assembling materials.
17. Assignment or volunteer selection of specific individual and group tasks or projects.
18. Commencement of individual and group work upon the materials for study, under the direction of the teacher.

Illustrations

No one definite mode of procedure should be followed slavishly and invariably in developing a unit. Any one of the following general practices may be used :

1. If a workbook is being followed, the unit will be outlined and printed in advance, together with adequate instructions for the group or the individual to proceed with or without discussion or aid from the teacher. Practices of opening the units will vary with the different printed outlines and instructions for the workbook units. Therefore it is obvious that the activities of the class or of the individual will be governed largely by the written assignments and suggestions of the workbook.

In some cases general instructions in the preface of the workbook govern all units ; in other cases either supplementary or complete instructions accompany each unit. In the following illustration the general

instructions were carried in the preface of the workbook. It is drawn from the writer's unit on "The Workbook in the Secondary School." A similar procedure would be applicable to any subject in the secondary school.

VIEWPOINT

The workbook idea when used to encourage initiative and to promote independent thinking upon special interests rather than to standardize procedure and to restrict learning to fixed patterns is of much value in the secondary school.

STUDENT'S OBJECTIVES

General. Understanding of the values and limitations of the workbook idea and ability to apply it effectively in the secondary school.

Specific

1. Knowledge of the origin and development of the workbook idea.
2. Understanding of the limitations of the device.
3. Appreciation of its purposes and values.
4. Knowledge of the various types of workbooks.
5. Knowledge of the features of the workbook.
6. Ability to direct properly the use of a workbook.
7. Ability to direct a class in the preparation of its own workbook.
8. Other objectives of your selection.
 - a.
 - b.

LEARNING EXERCISES

A. *Relating one's own experience to the problem*

1. Describe your reaction and that of the class to the first workbook introduced by one of your high-school teachers.
2. Point out the values and limitations of the procedures as carried out in that class.
3. Observe one high-school class using a workbook and prepare a critical report.
4. Other learning exercises of this type.
 - a.
 - b.

(Followed by learning exercises B. *Mastery of references pertaining to the problem*; C. *Applying the problem to secondary-school subjects*; D. *Further study*.)

In this unit the procedures are of two types:

- a. Independent work by each student who wishes to work through the unit even though it is not discussed in class.
- b. Group work with class discussion when the learning unit on the workbook is included in the offering for the term.

For the independent work the student follows specific directions with little aid from the instructor after the directions have been discussed at the outset of the course. The directions standardize the details of the work with a view to making the written work commensurable, but the learning exercises provide ample opportunity for independent and creative thinking.

When the learning unit is attacked by the entire class, the students read through the printed learning unit before the class convenes and are invited at the opening of the class hour to give their reactions. The reactions consist of criticisms and restatements of the viewpoints and objectives; additions of other objectives; citing of experiences with workbooks in their own secondary schools (either as students or as teachers); questions about points not clear in the instructions or in the learning unit; checking the learning exercises considered worth while; addition of exercises designed by the students; whatever other reactions an informal free discussion may produce. After such a group conference each student is ready to attack the problem in the way which he thinks will bring most value to him.

2. The foregoing illustration has been presented on the assumption that a workbook would be in use during the introduction-and-attack stage. The same procedure could be followed if mimeographed sheets were used instead of the typical workbook.

3. A somewhat similar procedure could be followed from a plan worked out in advance by the teacher or one used with previous classes. Such a plan might be transcribed to the blackboard by a student as the discussion developed and to notebooks at the end of the discussions, although this would be somewhat wasteful of time and energy.

4. A fourth and more liberal procedure would be similar to the Miller contract plan. With little advance planning a problem would be stated, the guide lines set, and the development continued until the challenge had been completed. Details of this procedure were presented in Chapter VII under the Miller contract plan.

Study and Work

The introduction-and-attack period gradually passes into the study-and-work stage of the learning process presented in this chapter. During this second stage of the process the traditional recitation period vanishes. The typical high-school-class hour of recitation disappears. Students work on the unit in the classroom or library during the regular period in schools which have a formal schedule of classes and in the laboratories of the various subjects in other schools.

Purposes

The purposes of the second stage of the process are implied in the name Study and Work. The more specific purposes may be listed as follows :

1. Further planning as the unit develops.
2. Mastery of minimum essentials by all.
3. Pursuit of special interests.
4. Satisfaction of individual needs.
5. Development of initiative and self-direction.
6. Opportunities for creative achievement.
7. Improved study habits.
8. Proficiency in the use of learning materials.

Not all the planning for study can be done during the first stage, because of insufficient background ; consequently planning should continue throughout the study-and-work period. Ample time should be given for each pupil to master the essentials of the subject matter or to acquire skill to a specified degree.

For many pupils it is even more important that special interests be followed. The process will enrich their insight, broaden their understanding, and motivate them while the less able are mastering the essentials. Also, there will be a few pupils whose mental habits or whose information regarding the unit will need special attention. These needs, discovered in the first stage, should be met during the study-and-work stage.

One of the chief advantages of this procedure over the typical recitation method is the opportunity it offers for the development of initiative and self-direction in study. This advantage gradually leads to the best creative effort of which the pupil is capable. As need arises, the teacher is able to make brief suggestions toward improved habits of study and improved use of the library, of the maps and charts, and of other materials of learning.

Techniques

A large number of techniques or classroom practices may be used during the study-and-work stage of the unit. The following will prove effective as occasions for their use arise :

1. Questions of pupils answered by teachers or referred to proper library references.
2. Demonstrations by teacher or pupil when needed.
3. Field trip when valuable near-by visual material cannot be brought into the classroom or laboratory.

4. The classroom used as a workroom rather than as a place for reciting.
5. Observation of pupil's work by teacher for detection of error.
6. Stimulating suggestions by teacher pertaining to new content or to improved methods of work.
7. Radio materials used whenever possible.
8. Frequent use of slides, films, and other visual aids.
9. Reading of references and collection of data bearing upon the unit, pursued by pupils individually.
10. Informal discussion of common difficulties directed by teacher.
11. Brief reports by pupils on common difficulties.
12. Presentation of personal experiences of pupil and teacher relevant to the unit.
13. Work on individual supplementary topics chosen by pupil with the approval of the teacher.
14. Much use of maps, charts, models, and so forth, as needed.
15. Group work on special projects related to the unit.
16. Objective tests to discover pupil progress.
17. Suggestion of special reading or drill to remedy disabilities discovered by tests.
18. Instruction or other aid to the slower pupils by the abler pupils.
19. Gradual formulation by the pupil of his plan for the mastery of the problem or the unit.
20. Use of bulletin board and special reports to present to the group any current happenings relevant to the unit.
21. Interviews with adults known to be particularly interested in the field or problem covered by the unit.

The rich variety of procedures available for the study-and-work stage of the unit makes it a period of wholesome development. It should be clear to the beginning teacher that only those practices which give promise of being valuable should be applied to any given situation. Any attempt to use all the devices for all units, regardless of their appropriateness for the situations which arise, would defeat the purposes of the study-and-work stage. On the other hand, the newness of a practice to the teacher should not prevent its use. Nor should the result of one's first use of a device be considered a fair test. The various practices listed above will become more and more effective with constant and careful use.

The frequency of use of any practice will vary with the unit. In general, items 4, 7, 8, and 9 should be the usual everyday practices; that is, the classroom should be a workroom in which the pupils will pursue their attack upon the unit under the guidance and with the stimulation of the teacher. The other practices will be called into play whenever the need

arises. For example, even in a school in which the instruction has become thoroughly individualized, occasions will arise in which the most profitable exercise might be a demonstration, a report by a pupil, a general discussion of difficulties encountered by several pupils, a showing of a film or slides, or a reception of a radio broadcast. In a well-organized study-and-work group pupils will feel free to ask questions whenever a real need arises, the teacher will tactfully suggest corrective practices for errors he discovers, materials will be easily accessible to all, and a wholesome spirit of co-operation will prevail. The following illustration gives a typical picture of such a group.

Illustration

The illustration of the study-and-work stage is drawn from a senior class in social problems which had just completed the introductory period in its study of "The Community Fund." The community-fund campaign was being launched that week in the community. The problem had been defined, the local community-fund campaign had been discussed, plans had been made for attacking the problem, and the class had assembled for its first hour of study and work. In the school where the problem was being pursued the class plan was in vogue, instead of a plan for individual progress, and the day was divided into sixty-minute periods. In the following illustration of the use of the various practices just discussed the sequence in which the incidents actually occurred has been broken occasionally to illustrate the practices in the order in which they appear in the foregoing list.

1. As the hour began, pupils referred to their notes and selected from the shelves and cabinets the reference books and other materials needed for the plan of work which they had previously outlined. Questions as to exact location of some of the materials were asked and answered. Four or five pupils conferred with the teacher as to methods of beginning special problems which they had either volunteered or agreed to perform. From time to time, after all had begun studying, questions were asked on points not understood, and twice during the first hour pupils asked the teacher for his opinion on a problem which they wished to add to the program. One was relative to a comparison of the local community fund with those of other communities, and the other was a suggestion for a study of the causes of poverty. The teacher approved both ideas and gave references to information bearing on them.

2. A demonstration was given of a community-fund solicitor, one of the boys interviewing a housewife who had been listed to contribute five

dollars. He presented the arguments for the fund and pictured the severe needs of many families. She asked the usual questions about the cost of collecting and administering the funds, and he answered them satisfactorily. She finally raised the amount to ten dollars and signed the pledge slip.

3. A tour was made after school to the centers where aid was given by the fund.

4. 5. These items in the list above were carried out constantly; that is, the classroom was a real workroom and the teacher frequently suggested better methods of study. For example, he sat beside one rather slow pupil five minutes to help to outline a magazine article on the community fund; he pulled down a blind to shut out the sunshine which was causing a pupil to squint, and motioned the boy to turn his side to the window. To a girl trying to locate other towns in the state with community funds he pointed out the list of cities at the side of a map and explained how to follow the numbered and lettered lines from the margins to the location of the city after which the symbols "4M" appeared. He seemed to know what each of the thirty-three pupils was doing and had a practical suggestion to improve any defective method of study which he observed.

6. The teacher did not intrude upon the activities during the first hour, but instead checked work presented to him for criticism and made constructive corrections whenever he detected errors. Later in the week he inspected some graphs one group was constructing and advised certain improvements.

7. Not only were radio talks reported but several five-minute talks were prepared for delivery over the improvised radio during the integration-and-application period.

8. The regular community-fund-campaign film was presented in the school auditorium and discussed in a subsequent period.

9. All pupils were busy either reading references or collecting information in other ways about community funds. One girl spent a half-hour with the chairman of the local community-fund drive; the entire class spent from three to five one afternoon, guided by a community-fund worker, on a tour to various projects in the community which were carried out with community-fund money; and several reported the radio addresses heard one night about the campaign.

10. Several difficulties of a general nature arose during the six days given to the study-and-work stage of this unit. The first related to sources of information. The teacher asked for a volunteer to check the periodical indexes in the library for the current year, another to telephone to the office of the secretary of the community fund, and then discussed a mimeographed list of references which he handed to each pupil. An-

other general problem which arose was that of the degree to which political science, sociology, and economics should be studied to determine the causes behind the need for a community fund. Two debates and several essays developed from the discussion of this point and were used during the integration-and-application stage of the unit. It was the teacher's practice to call the attention of all in the room whenever a point of particular interest or difficulty was mentioned by any pupil. This occurred at least twice each hour. Usually the matter consumed only a minute or two.

11. The difficulty of recent references was cleared up by reports from the pupil who telephoned the secretary's office and the one who had inspected the periodical guides.

12. The tour was discussed the day after it had been taken; several pupils reported cases of needy families; one girl told of her father's work as captain of the solicitors for her neighborhood; and other experiences of interest were reported.

13. Most of the special problems arising from the unit were chosen by pupils interested in them, whether previously listed by the group or originated by an individual pupil later. An example of the latter type was the suggestion by one pupil that he prepare a graph showing the amounts of the funds each year since the first local community-fund campaign.

14. Various individual and group projects resulted in maps, charts, and graphs. Also, these types of materials were included in the references and record studied by the pupils.

15. Three boys constructed a "thermometer" to show the amount collected daily in the campaign as reported by the local papers.

16, 17. In this unit no test was given during the study-and-work stage.

18. The more capable pupils aided their colleagues in the preparation of the two debates. The leaders of several group projects aided the less experienced or less able in their groups. In this unit, however, there were relatively few opportunities for the abler to assist the slower. Each pupil had either selected or been assigned work fitted to his abilities.

19. During the six days each pupil read the general references and organized his own special problem or problems. All understood, for example, the kinds of work done with money from the community fund, how the fund was collected, and all had gained some concept of why such a fund is necessary. Special graphs were prepared by some, a chart of agencies and of the expenditures for each was prepared by one group, and a pin map of the community was prepared to show the location of the various centers through which aid was given.

20. In this particular unit the newspapers were followed closely, clippings were posted daily, and a graph was placed on the blackboard to show the progress made in the collections as reported through the press.

21. A committee of three interviewed the chairman of the campaign and reported to the class. Later, one of the captains addressed the class.

At the end of six days of study and work the pupils were ready for the third stage of the unit, the integration-and-application period of three days.

Integration and Application

Some of the activities of the third stage of the unit, the integration-and-application stage, have been suggested in the foregoing illustration of the work of the social-problems class on the community-fund unit. For example, it was stated that debates, essays, and radio talks had been prepared for use in the three hours of the integration-and-application period. The community-fund unit, just used as an illustration, need receive no further attention at this point. Instead a general discussion of the integration-and-application stage follows. First, the purposes of the period are treated; next, its techniques and methods; finally, illustrations are drawn from secondary-school classes.

Purposes

The purposes of the integration-and-application period are essentially those of the generalization and application steps in the Herbartian system or those of the organization and recitation parts of the Morrison plan. The main purposes may be stated as follows:

1. Opportunity for group discussion of the information collected during the preceding stage.
2. Correction of wrong notions which pupils may have acquired.
3. Reorientation, and addition of information.
4. Opportunity for summarization and thorough mastery.
5. Opportunity for audience situations for practice in delivering expository or argumentative speeches.
6. Socialization of experience.
7. Stimulation of thinking.
8. Generalization and statement of conclusions or findings.
9. Application of information to meaningful situations.
10. Discovery of new avenues of study.

Much of the work previous to the integration-and-application period is done individually or by small committees or groups. In a school in which progress and promotion are by individuals rather than by classes the integration-and-application period would remain less socialized than

is implied in the list of ten purposes. It would have less discussion. In some subjects there would be little, if any, group discussion, although in subjects in which content is to result in emotionalized attitudes the opportunity for discussion should be provided even in individualized schools. Correction of wrong notions, the second purpose listed above, would be achieved through diagnostic tests and self-corrective exercises to a greater degree under a thoroughly individualized plan than under the class plan. Reorientation would occur as the false notions were corrected and as new information was added during the discussion or during directed individual study. Purposes 5 and 6, audience situation for speeches and socialized experience, would be achieved to a greater degree under the class plan than under an individualized plan. The other purposes should be achieved equally under the two general plans of pupil progress: the class plan and the individual plan.

Techniques

The techniques or procedures of value in the integration-and-application stage are as follows:

1. Demonstrations of processes mastered.
2. Exhibitions of products made.
3. Talks by pupils on some topic or phase of the unit.
4. Oral reports on supplementary topics.
5. Presentation by the teacher of additional material of interest not thought of or discovered by the class.
6. Dramatization of episodes studied or, in the field of English, the staging of original one-act or other plays.
7. Written reports on some topic or phase of the unit and on supplementary topics.
8. Debates.
9. Defense by students of their solution to problems.
10. Presentations of various types to school assemblies, community clubs, and service clubs.
11. General discussions.
12. Summarization by the teacher or by a pupil of the work of the class.
13. Presentation of outlines or briefs for criticism of a group.
14. Preparation and compiling of various types of portfolios as a permanent record of work done.
15. Preparation of articles based on the unit for the school or community paper or for magazines.
16. Planning for definite use of the information of the unit in home activities, in extraclassroom activities, and in subsequent school-work.

Each of the sixteen practices has a definite place in almost every unit or complete learning experience in which a class might engage. Demonstrations are especially valuable to give the entire group the results of individual effort; exhibitions motivate as well as aid in visualizing outcomes; dramatizations fix episodes vividly in mind and give practice in speaking before groups, which is also true of other types of presentations; portfolios help the pupil to organize his knowledge and to preserve records of work; debates stimulate careful study and organization of materials while training in oral presentation; articles in print encourage careful writing and serve also as records; and similarly each of the other techniques has its peculiar value in furthering subject-matter mastery and pupil development.

The list above, though adequate for the successful integration and application of any unit, does not include all devices of value in attaining the purposes of this stage of work. Ingenious teachers have devised and will continue to devise additional practices to help their students to integrate and to apply the information collected during the study-and-work stage.

Illustrations

In illustrating the practices of the integration-and-application stage of the learning process being set forth, a plan different from the one used for the study-and-work stage will be used. Instead of concentration on a single unit, usages will be drawn from various units to illustrate the several practices listed above. All are drawn from schools in which the class plan rather than an individualized plan of pupil progress is in operation.

1. In one school a pupil who had become skilled in the use of a lathe demonstrated it to a group of four boys. In an English class at work on oral composition a speech by a well-trained pupil was presented as a demonstration for the others. The demonstration of techniques in experiments is universally used in chemistry and physics. Time and energy may be saved by the teacher's demonstrating the process at the outset; but after a pupil has mastered the techniques of a process, he will gain confidence by demonstrating it to others and at the same time will set an example for them to follow in subsequent work.

2. The collections made by one history class which studied local history were exhibited in a store window in a small town. Portfolios prepared by five sections of a senior class in American history on the unit "Transportation" were displayed in the community library after judges had ranked them.

3. Floor talks by pupils are used frequently in many secondary schools. The case given here was observed recently. The class was one in seventh-grade geography, and the unit dealt with the Great Plains. A ten-minute talk on the drainage system of the Great Plains was given by one of the pupils, who illustrated her talk with freehand sketches on the blackboard. When she had finished, the entire group, led by the girl who had just spoken and aided by the teacher, discussed the influence the rivers had had in the development of the region.

4. In discussing the influence of the rivers in the development of the region mention was made of the Lewis and Clark expedition farther north. One member of the class volunteered to report the next day on incidents of the expedition not covered in the regular textbooks. This report required five minutes the following day.

5. Material not included in any of the references was presented by the teacher of a physics class who had heard the radio address on wire-photo, New Year's Day, 1935, by the president of the Associated Press. The teacher drew sketches to explain the process as it was applied that day for the first time to American newspapers in a systematic manner. The material was introduced as an elaboration of a point which arose during the group discussion.

6. A dramatization of the signing of the Declaration of Independence was observed in one history classroom. Another class dramatized Franklin and Washington discussing their current events. Another class became the Congress of Vienna for a day. Social studies so abound in opportunities for dramatization that overuse of the practice sometimes occurs.

7. Written reports are frequently used but commonly are less valuable than well-prepared oral reports. An oral report is the more likely to stimulate both the speaker and the group. The written reports, when used, are based on any relevant topic of interest or importance to the group or the individual. Thus, such reports as the following might be of value: a summary of a trip to a flour mill; an account of the growth of radio; a description of some character in history, current life, or fiction; a summary of a committee's findings on how school funds are raised; a paper on how chemistry has aided the automobile industry.

8. Each year teachers in various fields in several thousand high schools have the opportunity to link certain units to the subject for debate in the national contests. Other topics of current interest, such as self-control in industry, universal draft in wartimes, governmental control of water power, and the effect of various relief measures, might become associated with a unit of study and lead to valuable debates. Controversial points which arise during discussion may frequently be used in subsequent debates.

9. Less formal procedures than the debate may be used to enable the

pupil to defend his stand on any problem, such as those just mentioned, for which there may be more than one solution.

10. A school assembly, and later a parent-teacher meeting, witnessed a health pageant presented by an eighth-year class as a summary of three units they had completed. Kiwanis and Rotary programs were supplied by a senior class in the form of a debate on Federal aid to states for education.

11. In a class in English, after each of four pupils had given floor talks with illustrations on "The Ballad" to summarize a short unit on ballads, a twenty-minute discussion of the features of the ballad resulted in the proposal that each pupil try his hand at writing one. Several of those read the next day were particularly good, especially one entitled "John Dillinger."

12. Occasionally the teacher may summarize the work of a class, but as a general rule pupils should be taught to summarize their own work. It is an important step in the learning process.

13. Frequently, while a class is learning to summarize its work in outline form, it will be necessary for the teacher to discuss and criticize the outlines. This is true whether or not the unit is a true problem. Also, if the teacher feels that for a given unit a discussion of some pupil's summary would integrate the information, he should have the outline read and criticized. For example, the community-fund unit, previously discussed, would need such treatment inasmuch as it would be drawn from sources outside well-organized textbooks.

14. The Junior Red Cross through its international good-will program has sponsored the making of booklets of schoolwork for exchange with pupils in other countries. This procedure provides extra incentive for drawing together the results of a unit in an attractive portfolio for use as a record or as a part of the good-will program.

15. Numerous secondary schools publish their own newspapers, and others supply local papers with outstanding pieces of work done during the integration-and-application stage.

16. In the practical arts almost all the content of a unit may be applied at home. For example, courses in sewing and cooking provide definite content for use at home and, at the end of each unit, plan for such use. To an even larger degree this is true of vocational agriculture, in which the projects are based on the units studied.

Any reader with recent experience as a student in a progressive public secondary school will be able to add other illustrations. Progressive teachers look upon the integration-and-application period as a time to be emphasized in their teaching. New ideas for drawing together and applying content may be observed in almost any up-to-date secondary school.

Appraisal of Outcome

Three stages of the learning process have been treated thus far. An analysis has been made of the introduction and attack, the details of the study-and-work stage have been discussed, and the purposes and processes of the integration-and-application stage have been presented. Illustrations have been given of pupils actively engaged in each of the three stages. There remains the concluding stage, which grows out of the integration-and-application period. It is the time for a final appraisal of the outcomes of the unit.

Purposes

The general purpose of the final stage of the process, implied in its title, may be subdivided as follows :

1. Review and final summary.
2. Final check for errors, omissions, and misunderstandings.
3. Listing of worth-while results in terms of habits, attitudes, appreciations, or useful information.
4. Measurement of growth.

The order in which the purposes might be achieved would vary with units. Usually the final overview would immediately follow the integration-and-application stage, but measurement might often precede and be the basis for the final check of mastery. This would be true in the case of a diagnostic test over a unit. In units in which pretests have been given the measurement will show growth in knowledge of content between the pretest and the final test rather than just the final status of the pupil. The actual listing of values might frequently be the last purpose achieved. Regardless of order, all four of the purposes should be realized before the unit is finished.

Techniques

The procedures by which the purposes may be achieved are as follows :

1. Preparation of final summary by individuals.
2. Preparation of final summary by committees.
3. Preparation of final summary by class.
4. Brief presentation of final summary by individuals or by a committee chairman.
5. Oral questioning by the teacher on confused points.
6. Performance tests.

7. Achievement tests.
 - a. Standardized.
 - b. Informal objective tests prepared by the teacher.
 - c. Informal objective tests prepared by the class.
8. Review and remedial teaching based upon the tests.
9. Discussion of general errors or misunderstandings.
10. Conference to list the main values achieved.

At the end of the integration-and-application stage plans should be made for the final step of appraising the outcomes. The actual summarizing suggested in items 1 and 2, p. 213, could be carried out in the classroom during the class hour or elsewhere. Item 3 would consist of a conference during the class hour in schools with the class plan rather than an individualized plan. Items 1 and 2 should be followed by brief reports and constructive criticisms. Whenever the teacher detects a misunderstanding or a false notion, he should quiz the pupil and clear up the difficulty.

In typing or in other studies involving the manipulation of machines a performance test is valuable. The idea is applicable also to work in oral English, or speech, by demonstrations of ability to speak to audiences.

A chief function of the final stage is the measurement of the outcomes with objective tests. The tests may be either published standardized tests or those constructed by the teacher or by the class. The tests should be diagnostic, to provide a basis for remedial or supplementary learning. The length of the appraisal-of-outcome stage will depend upon the amount of additional learning necessary for adequate understanding of the unit.

The group eventually should list the values achieved through their study of the unit. Each pupil might prepare a list before the conference, or the list might be developed by discussion during the conference. It should parallel the original purposes set up by the class during the introduction-and-attack stage.

Illustrations

Illustrations of the techniques are implied in the foregoing discussion. Samples drawn from classrooms, however, will aid in clarifying one's understanding of the practices.

1, 2, 3, 4. At the end of the integration-and-application period of a four weeks' unit on "The Westward Movement" the teacher suggested that each pupil draw up for group discussion a summary of the main points in our national expansion. Three pupils asked if they might work together as a committee and were permitted to do so. Later in the hour

the committee offered for class approval the summaries they had prepared, and brief discussion was given them. By the end of the hour a good summary was in the mind of each pupil as well as in his notebook.

The last stage of the community-fund unit was handled somewhat differently. During the first appraisal-of-outcome session an informal discussion was held, without previous concentration on the final summary, during which each committee contributed an abbreviated statement of its study. Their statements were concisely worded by the group and placed on the blackboard. Additions were made by individuals. Finally, the statements were numbered in logical order, regardless of the order in which they had been listed on the board, and transferred to the personal records of the pupils.

5. During the summarizing session of "The Westward Movement" the teacher, sensing certain misunderstandings, questioned both the pupils who gave evidence of them and those who could give the correct statement. For example, one pupil did not clearly understand France's reasons for disposing of the Louisiana Territory, and another cleared up the point satisfactorily for a group of juniors. Another pupil confused the Northwest Territory with the present Northwest of the United States. By reference to a map the misunderstanding was cleared up.

6. A teacher of typing, after his class had practiced typing business letters from their shorthand notes, dictated a letter, gave a signal for all to begin typing, and timed the individuals on their reproduction of it by checking the time when each finished. Each pupil checked his own work and began practice designed to correct the errors.

7. Standardized achievement tests are available for all academic secondary fields and for many of the topics in the special fields. The techniques for building objective tests will be discussed in a subsequent chapter.

Secondary-school pupils are capable of building objective tests over their own subject matter. For example, each pupil who worked on the community-fund unit might have contributed ten objective-test items of a simple type, from which a test might have been built by a committee.

8. In mathematics, particularly in the junior high school, workbooks are available with diagnostic tests for all processes involved. These workbooks carry answers and practice exercises so that the pupil can give himself the test, score it, and then practice on the processes missed. Similar tests are available for punctuation. To a lesser degree the idea may be applied to any subject.

9. It is economical for the teacher to explain any errors common to several pupils which have persisted until the final stage of the unit. For example, a teacher of physics found five pupils still unable to translate readings from one thermometer to another with facility at the end of a

unit on heating systems. While the remainder of the class began the next unit, he drilled the five until all understood the mathematics involved.

10. Outcomes listed by pupils at the end of the community-fund unit were as follows :

- a. Understanding the need for relief and a favorable attitude toward the campaign.
- b. Sympathy for the worthy persons in need of relief.
- c. Confidence in the management of the fund.
- d. Willingness to help to solicit for the fund.
- e. Knowledge of the techniques of propaganda and publicity used in such drives.
- f. Knowledge of the amounts collected in various communities in the current year and in earlier years.
- g. An appreciation of the relation of the form of government to relief.
- h. Knowledge of the relation of crime to relief.
- i. Knowledge of some proposals to eliminate the need for relief.

The final stage of the process, the appraisal of outcome, binds the unit together in the learner's mind. It makes of the unit a finished product and gives the pupil the feeling that he has accomplished something worth while.

Concluding Statement

The four chapters of Division II have traced the development of the unit idea in teaching and learning, have analyzed the features of nine applications of the idea, including the workbook, and have developed the better practices of the various plans into a four-stage process of Introduction and Attack, Study and Work, Integration and Application, and Appraisal of Outcome. The present chapter has set forth the purposes and techniques of the newly developed plan and has illustrated each procedure used in the four stages.

In the application of this four-stage learning process to any secondary-school field the teacher should be in position to draw upon the better practices of more typical classroom teaching. He will find that many well-established and long-used practices are of value in directing classroom activities along more modern lines. For example, the underlying principles of planning instruction and the principles of making assignments apply to the four-stage learning process described in this chapter. Planning must be done even more carefully under this process than under the recitation system, and the assignments, though written in large part, must

incorporate sound practice. Visual aids are as valuable under the unit procedure as they have been in earlier classroom practices, and a new instrument in instruction, the radio, is making itself felt in the modern classroom. Every teacher should know the elements of scientific measurement of pupil growth and achievement, and, until the marking system has been abolished, all should understand how to mark with reliability and fairness.

It is the purpose of Division III to present such information and to relate it to the four-stage application of the unit idea described in this chapter. The chapters of the division will follow the order in which the procedures have just been mentioned: planning the learning activities and stimulating their performance; visual aids in learning exercises; the radio in education; principles and instruments of measurement; application of measurement.

SELECTED REFERENCES FOR FURTHER STUDY

See the references for Chapters VI, VII, VIII.

DIVISION III

Additional Classroom Procedures



CHAPTER X · Planning Learning Activities and Stimulating Their Performance

CHAPTER XI · Planning Learning Activities and Stimulating Their Performance (*Continued*)

CHAPTER XII · Visual Aids in Learning Exercises

CHAPTER XIII · The Radio in Education

CHAPTER XIV · Principles and Instruments of Measurement

CHAPTER XV · Application of Measurement



CHAPTER X · Planning Learning Activities and Stimulating Their Performance

GENERAL VIEW OF THE CHAPTER

Purpose of This Chapter and the Next

The Old Concept in Planning versus the New

Advantages Derived from Proper Planning

Factors in Planning

Articulation of the Secondary-School Program with Elementary-School and Postgraduate Activities

The Classroom Teacher and Curriculum-making

Principles of curriculum-making which should be the common knowledge of all teachers

Sources from which school experiences may be drawn

Selected References for Further Study

Purpose of This Chapter and the Next

THE ability to plan the learning activities is an essential part of a teacher's equipment under any method of instruction. Success in teaching depends to a large degree upon skill in selecting and organizing content and materials of instruction; in adapting the subject matter and procedures to the needs, abilities, and interests of pupils; and in arranging the activities so that they will articulate in the best way with the pupil's past experience and his anticipated future experience in the given line of activities or subject-matter field. The processes involved in selection, organization, adaptation, and articulation of activities and content must be carried out in the major part before the learning activities are pursued. The materials, activities, and methods must be planned in large measure in advance of classroom use.

The purpose of this chapter and the next is to present certain viewpoints and to discuss the various abilities involved in planning instruction. Special stress will be placed upon the procedures of planning as they relate to the four-stage application of the unit idea presented in the preceding chapter. Many of the procedures presented, however, are as applicable to any other general plan of teaching as they are to the unit plan elaborated in this volume.

The Old Concept in Planning versus the New

The chief contrast between the old and the new viewpoints in planning instruction is that the older centered upon smaller portions of content or segments of experience than the new emphasizes. Whereas the old was concerned largely with the daily lesson, the new emphasis is upon complete learning experiences, or units. The earlier procedures resulted in highly routinized classroom activities, differing but slightly from day to day, regardless of the subject matter or field being covered. Teaching became a formal procedure and the lesson plan a fixed device which the procedure followed. Small wonder the more energetic and the more independent individuals rebelled against the boredom imposed by such a program. Even the followers of Herbart sacrificed the spirit of his philosophy for its form and attempted to telescope the five steps of their plan into the limits of one class hour.

Until quite recently writers in the field of method have been so chained to the traditional that it has been impossible for them to view planning in its larger aspects. "Daily lesson plans" abound in books on method, giving the erroneous impression that learning occurs in isolated daily segments. School administrators and teachers alike have been slow to realize that there is nothing sacred in the highly organized schedules of recitations and nothing of fundamental importance in the clanging gong that ends one period and begins the next, often in the middle of a valuable discussion. Planning in the past has been dominated by the daily-recitation system. "Lessons" have been built to fit the standard period of forty-five or fifty minutes. Too often the daily lessons have been isolated and unrelated bits of information, with the result that learning has been sketchy and fragmentary instead of continuous, well-rounded, integrated, and unified. The implication has been that learning is the amassing of factual information, often unrelated, rather than the gradual growth of the individual as he uses large segments of knowledge in broad, wholesome experiences of vital significance to him.

Another distinction between the old concept of planning and the new is the shift of emphasis from the subject matter to the pupil. In the old the content to be mastered, the subject of study, was given the right of way over the needs and interests of pupils. Plans were built entirely around subject matter. It was assumed that all pupils could master the content completely, and punishments were provided if they failed to do so. The pupil's interests were ignored; in fact, it was assumed that a kind of char-

acter development automatically accompanied the doing of unpleasant tasks and that learning therefore lost some of its value if the pupil enjoyed it.

The newer concept of planning differs from the old in both aspects just discussed. In the first place, planning in the new sense embraces more than a day's activity; in the second place, it considers the pupil's welfare of primary importance and looks upon subject matter as racial experience to be made the personal experience of the pupil as his development calls for it. This newer type of planning does not bow to the established classroom regime; instead it would cast aside the mechanical schedule of classes as soon as possible and remove the gong from the corridor wall. The recitation process is relegated to a minor place. Study and independent work are emphasized. The individual pupil and his work become the primary interest of the school, though provision is made for group activity. Plans are built to encourage the pupil's growth, with full consideration of his needs, interests, aptitudes, and possibilities. The old mode of planning confused the pupil by cluttering up his mind with meaningless information; the new method of planning attempts to facilitate his progress toward his chosen objectives and draws upon racial experience whenever it will clear the way and accelerate the rate.

Advantages Derived from Proper Planning

The preceding section has implied that certain values may be derived from proper planning of the learning activities. The values which one may expect to derive from planning should in large measure govern one's procedures in planning. Consequently the anticipated advantages become criteria and as such should be clearly in mind at the outset of a discussion of the techniques involved in planning learning activities.

Perspective

Proper planning gives the teacher perspective. It enables him to see the following types of relationships:

1. Relation of his field to the purposes of secondary education.
2. Relation of his field to other secondary-school fields.
3. Relation of a given year's work in his field to the pupil's previous related experiences since entering kindergarten or the first grade.
4. Relation of the year's work to the pupil's anticipated future experience — collegiate or noncollegiate.

5. Significance of any given unit in a field to each of the foregoing relationships.
6. Significance of each day's work to the unit and to the larger relationships.
7. The place of each learning activity in the larger scheme of relationships.

Thus the teacher who plans with intelligence never loses sight of the forest because of the trees. Each procedure has its proper place in an ever-widening scope of activities, and all are directed toward those worth-while ends which systematic planning enables the teacher to hold in mind.

Attainment of Objectives

Unless the teacher plans the activities of the classroom with the objectives of secondary education in mind, there can be no certainty that those objectives will be attained. Appreciation of objectives should be the starting point in planning the learning activities, and the activities should be evaluated and subsequently selected for the contribution which they give promise of making toward the objectives.

Fulfillment of Class and Pupil Needs

The specific needs of the class and those of individual pupils should not be left to chance discovery and fulfillment. Careful diagnosis should discover needs, and those needs should be met by careful planning. Whole classes may be found deficient in fundamental concepts which are essential to progress toward a given objective. Careful planning of learning activities is the first step in removing the deficiencies. More often individual pupils will lack the skills, attitudes, or information necessary for their progress; in like manner thoughtful planning is essential to the progress of such pupils. The fulfillment of the general and specific needs of the class or of the pupil is a major advantage of planning.

Consideration of Relative Values

If the teacher does not plan well, many activities in his classroom will be of relatively little value. It is only through planning that the activities and content of greatest value can be selected for the classroom. It is not possible to plan every detail of activity; and if it were, some of the planned activities should be cast aside for spontaneous activities of greater value which arise during the pupil's attack and study. Nevertheless, greater progress will occur when the teacher, either alone or in

co-operation with the pupils, has selected in advance of the attack those activities which are considered most worth while.

Opportunity for Mastery

In any method of learning, a degree of mastery commensurate with the pupil's ability is essential to satisfactory progress. Several factors are necessary before the proper degree of mastery for a given pupil can be accomplished. First, the teacher must know the pupil's ability; secondly, he must know the difficulty of the activity; thirdly, he must allot the proper amount of time for the pupil to obtain whatever mastery he is capable of attaining. All three aspects of this process call for careful study in advance of the classroom activity. A proper degree of mastery is dependent upon intelligent planning by the teacher.

A Guide to Classroom Practice

Even a teacher of experience would often fail to make best use of the schooltime if he did not plan his work, while an inexperienced teacher under similar circumstances would frequently be seriously embarrassed. The broad plan of a year's work or the smaller plan of a unit provides a charted course to be followed and thereby reduces to a minimum aimless activity or embarrassment at not having desirable activities to suggest. The planned program should not be followed slavishly, however. Its use should be flexible enough to yield to unforeseen though worthy demands as the individual or the group progresses along any desirable line of activity.

Variety of Activities

Careful planning enables a teacher to provide a wide variety of activities. Unless this is done consciously, there is danger that the classroom activity will degenerate into a dull and boring process out of which might arise serious disciplinary difficulties. In such cases the teacher is at fault, not the pupils. They should be congratulated upon rebelling against a stupid program.

Illustrations

One aspect of a well-made plan is its provision for illustrating processes to be learned or principles to be applied. Apt illustrations do not always occur to the teacher on the spur of the moment. It is safer not to rely upon inspiration entirely, but to construct good illustrations in advance

of their need. If better illustrations come by inspiration, they may be substituted for those planned; but the teacher should never be in the embarrassing position of not having a good illustration ready when the need for it arises.

Materials

A good plan lists the materials which will be needed on a given day. They should be ready at the beginning of the day's work, whether the school operates upon the class plan or the individualized plan. Frequently pupils will co-operate with the teacher in arranging the materials or even in listing them in advance of use, but their co-operation is contingent upon previous planning by the teacher.

Record of Work

It occasionally becomes necessary for a substitute to have charge of a teacher's work. Carefully prepared plans are highly important in such cases as records of work already covered and as outlines of procedures to be used. Although any plan built to fit one group should be thoroughly revised before it is used for a different group, as a teacher grows in experience he finds that his plans of previous years save him much time. They provide the starting point for his new plans. Furthermore, the teacher who jots down brief notes on the success or failure of certain parts of the plan as soon as it has been used will be assisted materially in subsequent years when his classes attack the same or similar units.

Factors in Planning

Broadly conceived, planning the learning activities consists of providing for the use of fields of study and of pupil experiences in such a way that pupils will make progress toward the objectives of secondary education. The magnitude of this task becomes apparent when one realizes that the program involves more than five million pupils and that the secondary school must select the activities for them from the whole range of human knowledge and experience. To these somewhat startling facts should be added the difficult problem of objectives. Objectives keep retreating as civilization advances. Those set for one generation will not be suitable for the next. The problem of guiding the five million toward their goals through wise use of our social heritage becomes more difficult as objectives shift. Thus conceived in its entirety, the large problem of

planning offers a distinct challenge to the teacher. An important step in the solution of the problem is a consideration of the various factors which determine the nature of any given plan. Although the factors are isolated in the following discussion, it should be realized that all must be considered together in the work of the teacher.

The Time Factor

The nature of a plan varies according to the amount of time it is intended to cover. Thus a plan may be for six weeks, a semester, a year, or the entire school span. Every teacher should know in advance of his teaching of any class or grade just where that year's work fits into the entire school program for the field of activities or subject. This phase of planning is too frequently ignored. It is of such importance, however, that it should precede all other types of planning.

An illustration of planning the entire school offering in a field is afforded by the work of the Science Committee of the National Society for the Study of Education.¹ In the report of this committee the science offering for the kindergarten and each of the twelve grades is outlined in its main features. The objectives are set up first, then the content and activities are selected and arranged to carry out the objectives. Thus a teacher of any grade is able to see the relationship of that year's work to the whole offering in science. While only the larger topics or experiences are included in the plan for the entire offering, the basis for elaboration is laid systematically. The framework should thus be prepared as the first step; details can be added later.

The beginning teacher will not be required to formulate such a comprehensive plan. His relation to a plan of that type will be that of student. He should study the plan for the entire offering in the field he expects to teach and have a clear view of all its parts. His view should not be limited to the part covered by his one year's course.

From the standpoint of the time factor the second type of plan is the year's plan. Since it is the purpose of the present discussion merely to indicate the various factors involved in planning, detailed analysis will be omitted. Other types of plans related to the time factor are the semester plan and, less definitely related to time, the unit plan. Formerly the daily plan was considered of major importance. Now it is regarded as a

¹ S. Ralph Powers (chairman) and others, "A Program for Teaching Science," *The Thirty-first Yearbook of the National Society for the Study of Education, Part I*. Public School Publishing Company, 1932.

part of the plan for the unit and should not be segregated from the larger segment of subject matter or experience of which it is a part.

The Content Factor

The nature or appearance of a plan varies also according to the content or activity involved. In the first place, plans differ with the various fields of study or lines of activities. Thus a plan in the field of mathematics differs from a plan in the field of the social studies, in part because of the difference in the learning activities or the content involved.

In the second place, within any given line of activities or field of study plans may vary with the varying types of content involved in the exercises. Thus in the general field of science a plan covering a unit in physics would differ from a plan for a unit in botany. Similarly, in physics or any other given branch a plan for one unit would differ in detail from that for another unit. It would therefore not be wise to set up a form and attempt to fit all content into it ; there must be sufficient flexibility of form to permit whatever variations the differences in activities or content require.

The Factor of Method

The futility of attempting to set up a form to be followed in all plans is further emphasized when the factor of method is considered. A form which would fit a drill procedure might not fit a socialized discussion. An appreciation procedure would vary in outline from a review exercise. Similarly, each general type of procedure requires its own details of form, whether it be inductive, deductive, individualized, a demonstration, a project, a traditional recitation, or a creative experience. Furthermore, an inductive procedure, for example, in one field of content might not require the same form of plan required by an inductive procedure in another field. The same is true for other general types of method ; the form of the plan by which each is applied to a classroom situation varies according to the situation.

The level of teaching is another aspect of method to be considered in planning. The levels of teaching as defined by Courtis are as follows :

STAGE I. COMPULSION LEVEL

The subject-matter is organized wholly in terms of logical arrangement, usually of textbook arrangement. It is presented either orally, or by text, with or without some explanation by the teacher. Pupils are expected to learn the subject-matter by heart. The recitation consists in having the children give back what they have learned. Usually the form in which it is given must be

exactly that of the text. Much dependence is placed on repetition, review, drill. There is complete teacher domination and control and almost perfect attention because of the rigid discipline maintained by the teacher by force. Results in terms of knowledge are emphasized. Respect and unquestioning obedience are demanded of the pupils.

STAGE II. TEACHER PREPARATION LEVEL

Presentation of subject-matter is determined by the teacher's preparation rather than by the text, although based directly upon a logical outline of the text arrangement. The teacher attempts to "predigest" the lesson, and believes that the amount which the pupils will learn depends upon her efforts and explanations. Much use is made of the "five formal steps" or other formal lesson-plan schemes. Less rigid discipline is maintained than in Stage I, but more than in Stage III. There is still complete teacher control. The teacher "talks down" to her pupils and makes use of many tricks and devices. Recitations consist mainly in giving back of facts learned in response to questions and drill through repetition. The teacher will accept answers varying more or less from the original or textbook form, but the effect of teaching is still almost wholly judged in terms of knowledge and skill. The teacher is closer to her pupils than in Stage I, but still maintains her place as "Teacher" — a person consciously superior to the children in knowledge and virtue.

STAGE III. MOTIVATION LEVEL

The efforts of the teacher at this stage of development are consciously directed toward securing and holding children's interests. Subject-matter is organized about major topics, and provision is made for children's activities; but this is largely controlled by the teacher's directions. That is, the pupils are not encouraged to exert either initiative or spontaneity. Much more supplementary material is used than at Stage I and II, but the lessons are still distinctly subject-matter lessons, with activity brought in as a means of learning. Discipline is usually much relaxed, and teachers and pupils meet on a friendly basis. There is less emphasis upon knowledge than in Stage I and II, and more on construction and other handiwork. Drill and review are less evident, and there is often a lower standard of scholarship. Subject-matter limits are also less rigorously observed. Socialization of class work is sometimes attempted. This usually consists in having a pupil take charge of the class in place of the teacher. The result is seldom true socialization.

STAGE IV. PURPOSING LEVEL

Class work is consciously and obviously divided into two phases, part teacher-controlled, part pupil-controlled. The teacher assumes control during periods of stimulation and reflection; the pupils are in full control during periods of activity, the teacher merely assisting if needed. Pupils' activity

consists of the planning, executing, and judging essential to accomplishment of purposes. The pupils assign and appraise their own lessons. All class work and disciplinary control are almost completely socialized: that is, organized and administered by the group. There is almost no use of questions, directions, etc., by the teacher as a means of recitation. Emphasis is placed upon purposes, achievements, standards, and ideals, not upon results in terms of knowledge or skill. There is very little, if any, learning in the sense of committing to memory, *except as a means to an end*. There is much pupil-directed reference reading and wide use of rich supplementary material. There is little organization of subject-matter in logical sequence, the order and content of lessons being determined almost wholly by purposes. There is complete acceptance by the children of the teacher as one of the group, and almost perfect freedom of expression or of appeals for assistance.¹

To these four stages might be added the creative level, at which still greater freedom in learning would be permitted and each child encouraged to give expression to whatever wholesome creative ability he might have.

It is obvious that the plan of procedure would vary according to the level of teaching. At the compulsion level there would be little flexibility in the plan, whereas at the creative level there would be little organization and a minimum of prearranged activities.

The Pupil and His Stage of Growth

Even more important as variables to be considered in planning are the pupil and his stage of growth. Planning should start with the pupil rather than with the subject matter. Consequently the form and content of plans will vary according to the needs, abilities, interests, and purposes of the pupils. This implies that the teacher know the characteristics of his pupils in detail and that his planning consist largely of arranging educational experiences in the light of that knowledge. Thus instead of preparing plans which follow subject-matter outlines the modern teacher should adjust the work to meet the needs of the pupil. Such deviations may consist of remedial instruction to correct deficiencies discovered by diagnostic tests; of special emphasis upon interests vital to the pupil, though sometimes not in line with a logical arrangement of content; of individual projects accepted in lieu of class exercises of less value to the given individual; and, in general, of any adjustment which will enhance the value of the pupil's school experiences.

¹ Quoted in Leo J. Brueckner, *Scales for the Rating of Teaching Skill*, pp. 5-7. The University of Minnesota Press, 1920.

The pupil's stage of growth or mental age, as well as his personal traits and interests, is an important determinant of planning. In general, growth parallels grades or classes; yet within each grade pupils differ greatly in mental age. Proper planning will consider these differences and provide activities suited to each level of maturity.

The Teacher as a Factor in Planning

The prospective teacher should be unwilling to accept any stereotyped mode of planning. The teacher's own personality should determine in part the nature of the plan. Thus a teacher who has sufficient creativeness to use the project method successfully as one general procedure in his list of methods will arrange his classroom activities along more flexible lines than will the teacher with less creative ability. Also, as a teacher gains in experience, his planning will include new features which he finds effective. Again, a teacher's mastery of his field will determine in part the nature of his plan of work. For example, a teacher with a thorough mastery of his field will need only brief notes, or perhaps no written outline at all on some days, for his part of the classroom activities. At the other extreme, a teacher forced to teach a field in which he is poorly prepared might need copious notes on the content in order not to get lost as the class exercises progress through a unit of instruction. Unfortunately the latter situation prevails much too often in the small schools where teaching careers are most often begun.

The teacher should realize that systems of teaching and plans for instructional units should have no rigid and standardized forms with which all teachers must conform. Instead the teacher's personality, mental ability, experience in teaching, and preparation in the field should be a determining factor in the nature of the plan.

Objectives of Teaching as a Factor in Planning

In a previous chapter the objectives of education were treated in detail. All planning should be directed toward those main objectives. This applies to the plan for each instructional unit as definitely as to the larger aspects of planning the year or the whole secondary-school offering. For example, suppose a major aim of history in secondary school were to train technical workers for research in history instead of to instill proper social attitudes or to give an appreciation of the contributions different cultures have given to our present civilization or to do any one of the other important tasks of secondary-school history teaching. If such an aim

dominated the history teacher, his plan of work would not only demand the accuracy consistent with all good teaching but would also stress details of dates, sources of authority, documentary procedures, and bibliographical training uncalled for at the secondary level. His whole plan of procedure would be colored by the end he had in view.

The same principle should hold for the approved secondary-school objectives. Some instructional units should be definitely planned to contribute something toward one recognized aim, — health, for example, or citizenship, — while others should be consciously directed toward other aims. The end in view, or the purpose, should enter very definitely as a determinant of the nature of the plan.

General Form under Which All Factors Might Operate

Each of the six factors just discussed presents a distinct problem in planning learning activities. Time, content, method, the pupil, the teacher, and the objectives of education are all factors in planning which operate from different standpoints. To aid in integrating the various aspects of planning, it is well at this point to consider a general form of planning, highly flexible in its application, under which the six factors may operate freely in any or all of their details.

As stated at the outset of this chapter, special attention is to be given to the four-stage application of the unit idea presented in the preceding chapter. It will be recalled that the four stages are Introduction and Attack, Study and Work, Integration and Application, and Appraisal of Outcome. The outline provided by these four major steps in the unit plan of teaching and learning is the general outline under which the six factors in planning may operate freely. For example, the time factor is accommodated under the four-step outline. The unit outline may be extended to include the longest time period necessary or contracted to fit the shortest, while the yearly or longer program may readily be subdivided into units of varying lengths and thereby be absorbed. In similar manner the four-stage outline gives free play to the content and method factors in planning. Whatever the content is, if it is to be of significance in the student's life, it must be pursued through the four stages of the learning process involved in the outlined plan. Ample opportunity is afforded for the use of every conceivable technique of learning or teaching at one or another of the four stages. The same may be said for the factors of pupil, teacher, and objectives. The general outline affords opportunity for the satisfying of pupils' needs, for the exercise of the

teacher's initiative or the adjustment to differences in the teacher's personality, and for the direction of activities toward approved objectives. The sample learning units in the last section of this chapter illustrate the operation of the various factors of planning in specific situations.

Articulation of the Secondary-School Program with Elementary-School and Postgraduate Activities

A somewhat different problem related to instructional planning is the classroom teacher's part in paving the way for the pupil to progress smoothly through his entire school career, from the nursery school through the university. If any teacher fails to understand the offering of the school at earlier or later levels than his own, there will be lost motion in the pupil's progress. It is not sufficient for the teacher to know the earlier and later offering in his own field only. He should have more than a general notion about the entire offering of the public school. The secondary teacher's information should include a full understanding of the purposes of each field at all levels in the school system; and so far as possible it should also include a mastery of all fields through the secondary-school level, certainly all fields closely related to his own. This may seem an unreasonable requirement to the undergraduate student; if so, he is reminded that the day is rapidly passing when the four-year bachelor's degree will qualify one for public-school teaching. Very few persons, if any, have the ability to acquire sufficient mastery of the major fields of human knowledge within four college years to use that knowledge in the development of secondary-school pupils, to say nothing of the acquisition of professional education essential to effective teaching. Broad scholastic training and thorough professional knowledge are both necessary if the teacher is to plan his offering so that it will articulate with the remainder of the school program with a minimum of friction and waste time.

Another problem of articulation of much importance in planning instructional activities is that of learning to know the individual pupil as he enters each succeeding level of the school system. The secondary-school teacher is chiefly concerned at two critical points: the beginning of the seventh year and the beginning of the tenth year in the typical 6-3-3 plan of school organization. Information forwarded from earlier teachers forms the basis for planning the activities for the incoming pupils. The nature and value of such material in the teacher's task of planning classroom work are revealed in the following quotation from the yearbook on articulation:

These are the points relative to which information concerning each incoming junior high-school pupil is most frequently received: (1) I.Q., (2) Scholastic accomplishment, (3) Teacher's estimate of ability, (4) Health, (5) Special interests, (6) Special abilities, (7) Character traits and (8) Home conditions.

These are the uses made of the above information, listed according to frequency of mention by twenty-one school systems:

1. Aid to teachers in becoming better acquainted with pupils.
2. Foundation for various individual adjustments and useful in securing best possible individual development. An aid in counseling pupil as to choice of courses and elective subjects and in talking over with him his vocational plans. Helpful information for home-room teachers and for boys' and girls' advisers in dealing with individual cases, and counseling with parents.
3. Basis for ability or homogeneous grouping.
4. Guide for mapping out individual pupil assignments — also in adapting content and method to group abilities.
5. Serves as a beginning for individual case history of each pupil in the high school — serves as a foundation for counseling.
6. Aid to study-hall and classroom teachers in understanding children who need special care and guidance.
7. Basis for arranging individual schedules.
8. Special physical training programs dependent upon health information received from lower school.
9. Means of early selection of pupils for special work in music.
10. Basis of placement in some cases with particular instructor, where choice is possible, if student is a behavior problem.
11. Means of prevention of disciplinary problems.
12. Basis of pupil assignment to home rooms.
13. Guide to expectancy in quality of work and a means of checking accomplishment against ability.¹

At the beginning of the tenth grade a similar problem occurs in systems in which the junior and senior high schools are separate administrative units.

Just as important as the foregoing problem is that of planning the activities of a pupil so that he will be able to enter and pursue subsequent work successfully. To meet this obligation the teacher must know the abilities required for such success, and for each student the probabilities of his acquiring those abilities. Intelligent planning of instructional activities provides for the development of each pupil toward the highest ends he is capable and desirous of attaining. Only the classroom teacher

¹ Herbert S. Weet (chairman) and others, "The Articulation of the Units of American Education," *Seventh Yearbook of the Department of Superintendence of the National Education Association* (1929), pp. 11-22. National Education Association.

can do this planning effectively. The various types of guidance or personnel specialists found in some schools today should be considered assistants to the teachers until teacher-education programs incorporate such techniques in all curriculums or until teachers in service master techniques of guidance. The direction of the pupil's complete program of work, as well as his progress in any single field, is a function of the classroom teacher, one which demands that the teacher know the past record and present abilities of each pupil and the abilities needed for success in subsequent work. This knowledge is the foundation for the planning of activities which will cause the pupil to grow toward his personal goals and toward those which society has set for persons of his ability.

Still another aspect of articulation is the necessity of passing on to higher educational levels the personal records of the individual. The use of personal data in becoming acquainted with the pupil has been analyzed in detail in an earlier chapter. The teacher's problem does not end with the use of the data. He must collect new data and record them for subsequent use by teachers to whom the pupil is advanced. The nature of these data is made clear by the following quotation from the report of the articulation commission :

The following items, however, are those which senior high schools of twenty public school systems state that they send most frequently to the colleges or universities which their graduates enter. The items are arranged according to the frequency with which they are included in the pupil records.

Grade of work done, when and where done — units of credits and subjects in which credit was achieved.

Rating in moral character.

Mental ability — results of psychological tests and teachers' estimate.

Statement of personal qualifications or comment by principal.

Official recommendation of high-school principal.

Special activities report — accomplishment in extra-curriculum activities.

Rank in senior class in high school.

Schools attended, years, and date of graduation.

Length of recitation and laboratory periods.

Interpretation of high-school rating system : (a) grade required for recommendation to college, and (b) passing grade in school.

Age.

Health record.

Test records, if requested.

College course desired.

Regents' examination ratings.

Opinion was about equally divided among eighteen school systems as to whether the items which each included in the pupil records which it sent from

the senior high school to the college or university are adequate. These were among the additional items suggested:

Statement of pupil's vocational interests.

More information relative to student's personal attributes — personality traits and general outlook on life, i.e., better judgment of character qualities.

Cumulative case record — something like the material furnished the senior high school by the junior high school.

Guidance into or out of certain courses could well be specified in many cases.

Evaluation of ability of student — comparison of ability with achievement — definite statement from principal as to student's probable success in college.

Several school systems stated that at present the comments made to the university relative to the personal qualifications of prospective students were too often the opinion of one person. This suggested remedy came from San Francisco:

Each high school should have a teacher-committee to work up data on conditions for college admissions to include such items as scholarship, school citizenship, composite rating on character analysis blank, and rating on college aptitude or intelligence test. Candidates should then be arranged in order of rank and college authorities advised of each candidate's percentile rank among those seeking admission from the given high school.

One report from a large school system in the East stated:

The high-school principal is embarrassed by the multiplicity of forms and the varying amount of information required. Growing efforts toward standardization on the part of colleges in this type of blank are welcome.¹

The two years of junior college, Grades Thirteen and Fourteen, are a part of secondary education. Upon receipt of such data as the foregoing from Grades Ten, Eleven, and Twelve, together with records of earlier work and experience, as the students enter junior college, it becomes the task of the secondary teacher in junior college to plan instructional activities which will further develop each individual toward his own objectives and, to a less degree than at lower levels because of the student's growth toward independence of mind, toward those which society has set for him.

The several problems of articulation just discussed cannot be settled entirely by administrative officials. The practices which their solutions demand cannot be performed effectively and intelligently by the teacher, upon whom such performance falls, unless he understands the problem. These and other problems of articulation will be solved satisfactorily only when they are understood by the classroom teacher and considered by him as he plans his instructional and learning activities.

¹ Weet and others, *op. cit.* pp. 140-141.

The Classroom Teacher and Curriculum-making

It was stated in the preceding section that the classroom teacher should have more than a general notion of the entire offering of the public school. The entire offering of the public school includes more than the subjects of study. It includes also all other activities of the pupil associated in any way with the school. The wide series of experiences most erroneously called extra-curricular activities¹ forms an important part of the offering. These valuable school experiences, as well as the more formal subjects of study and other vital activities of the adolescent associated with school, constitute the offering of the school. For any one individual or group with like abilities and interests these activities constitute the curriculum² through which the adolescent pursues the purposes selected by himself and society. It is in this sense that the word "curriculum" is used in this section. More specifically, for any given pupil the secondary-school curriculum is the series of school experiences he has from the time he enters the seventh grade until he finishes the fourteenth grade, including all types of school activities in which he has a part.

One of the major problems relative to the offering of the school which the teacher must come to understand, at least in certain essentials, is that of framing such curriculums. Before a teacher is qualified to plan a program of instruction intelligently, he must understand the more fundamental principles and practices involved in curriculum-making. The purpose of this section is to introduce the broad area in the professional education of teachers called curriculum-making and to refer the student to other sources for further details.³

Principles of Curriculum-making Which Should Be the Common Knowledge of All Teachers

In recent years there has been a rebellion against the strait-laced formalized program, designed largely to "train the faculties of the mind," through which all pupils were forced to go regardless of their ability or interests and regardless of the value of the offering. Since the decay of

¹ The terms "allied," "co-curricular," and "collateral" activities, which have been derived by various writers, are fairly satisfactory, though usually admittedly temporary, adjustments of terminology. They have been used to suggest a closer relationship or perhaps more nearly an equivalence to the other offerings of the secondary school than is implied by the term "extra-curricular."

² The term "curriculum" means, in the Latin, "race course" and is derived from *currere*, "to run." The Latin spelling of the plural is *curricula*.

³ See the references at the end of Chapter XI.

the faculty theory of the mind and of formal discipline, greater stress has been placed upon social objectives of education and upon satisfying the needs of the individual pupil. The following principles have been developed to guide teachers and others in building curriculums to meet modern educational standards.

1. Each curriculum should contain content and activities directed toward each of the aims of education. A curriculum which would be entirely vocational in its aim, for example, would not be in accord with this principle.

2. Each curriculum should have a justifiable purpose for each of its parts. The fact that a subject has long been in the offering is not in itself a justifiable reason for its continuance. Each activity and each subject must be put to a severe test to determine whether it contributes to a worth-while purpose. If it does not, it should be discarded.

3. The present and probable future needs of the student should be a major determining factor in the selection of content for secondary-school courses. Content of no value in the development of the pupil should not be forced upon him. Such valueless material should be eliminated from traditional courses.

4. The mental maturity of the student should be a factor in determining the difficulty of the content. Until recent years textbooks in history for the "upper grades" were written in language too difficult for the average child in those grades to understand. The same criticism was made of secondary-school science texts. Recently the language of textbooks has been simplified in conformity with this principle.

5. Content suited to one group or individual, but not suited to another group or individual, should be offered only to those to whom it is suited. It is difficult for teachers to apply this principle because of the long-established practice of forcing upon students content for which they are not suited or in which they have no interest. Yet this is a central principle in curriculum-making and in modern classroom teaching.

6. In each curriculum there should be a core of subjects to be taken by all pupils, but these constants should be limited to subjects clearly needed by all in attaining the general aims of education. For example, each pupil's secondary-school experience should include mastery of oral and written composition in his native language, basic social training, and other fundamentals.

7. The subject matter and activities in the core subjects should be planned so that every industrious normal pupil can succeed in them within a reasonable time. These basic activities should be experienced with the satisfaction which comes with success. They are in no sense barriers set up to eliminate the unfit.

8. There should be some curriculums adapted to the average or less than average pupil. This principle may be achieved in two ways. First, whole curriculums may be set up for pupils of ability too low for them to succeed in the usual secondary-school subjects; secondly, within each curriculum ample provisions may be made for the growth of each normal pupil.

9. The proportion of courses required of all pupils should decrease as pupils progress from grade to grade through the secondary school. At a similar rate the proportion of courses which pupils may choose should increase. The more fundamental language, computational, and social concepts are included in the earlier years. Such general concepts should be acquired by all pupils in the courses taken by all. In later years the interests of students diverge; consequently the proportion of courses which are electives should increase to care for this differentiation of interests.

10. It is frequently recommended that teachers require a higher quality of work of their pupils in elective courses than in constants, or courses taken by all. It is not clear that this principle is sound. It smacks of a bargaining process in which the student is forced to do more to compensate for the satisfaction he gets from having had a choice of subjects. If the pupil is interested in the field, he will pursue the problems of the course happily without outside compulsion. If he is not interested, any outside forcing will further repel him from any learning activities.

11. Each curriculum in the earlier years of the secondary school should offer the opportunity for the pupil to explore widely in fields of possible future value to him. The early exploration should include broad courses in the main realms of knowledge as well as experience in various phases of the practical and fine arts.

12. The content included in the exploratory courses should in itself be of value to the pupil and not be considered solely as try-out material.

13. Each curriculum should be flexible. Pupils should be able to transfer from one curriculum to another, with as little lost motion as possible, if they find themselves unfitted to the one first chosen. Proper guidance at the outset will reduce the number of transfers to a minimum.

14. Each curriculum should be planned to provide the proper sequence of work. Not only should the courses be arranged in the best learning order but also the content within the courses should be arranged in this psychological order.

15. There should be a limited range of years in which a course may be taken. To permit seniors to attend classes predominantly for freshmen, for example, would be too wide a range and should rarely, if ever, be permitted.

16. Courses in which specific skills are developed should be planned to come near the time when the skills will be used. In a commercial-

education curriculum, for example, the skill subjects should come to their peak near the end of the curriculum.

17. Each curriculum should be revised continually to keep abreast of research and discoveries in the field. At this point the relation to the planning of the instructional activities is quite close. And in selecting this new content for his course and his curriculum the teacher should follow all the foregoing principles.

Quite apart from work in his classroom the teacher is frequently required to assist in general programs of curriculum construction. His contribution to such programs will depend upon his understanding of the principles to be followed in the work. It is not the purpose of this volume to outline in detail the practices of curriculum-making. That is a problem of sufficient size to require independent treatment. One other aspect of that problem is of such vital significance to the teacher's task of planning instruction, however, that it will be outlined in the following section. It relates to the sources of curricular content.

Sources from Which School Experiences May Be Drawn

The foregoing principles give guidance to the classroom teacher in the wider phases of his planning of instructional and learning activities. The next problem which arises is that of the sources of activities and subject matter to which the principles may be applied.

Two extreme views are held on this problem. The extreme activists insist that school experiences should be drawn very largely from the interests and activities of children. The extreme traditionalists, on the other hand, would have all school activities follow the lines of the standard fields of knowledge set up in a logical manner. Midway between these two extremes is found the most practical solution to the problem of sources of school activities. The main sources from which every teacher and class should derive school activities are as follows :

1. Interests and activities of the pupils.
2. Past experiences of pupils and teachers.
3. The natural, social, and economic environment of the local school.
4. Current records of local, national, and world affairs.
5. Analyses of pupil and social needs — present and future.
6. Standard fields of knowledge.

The order in which the sources are listed does not signify relative importance. For one activity the source listed third would be the most important ; for another some other source would be the most fruitful.

It should be noted clearly that the *class* as well as the teacher is to use the sources in selecting school experiences. Once the pupils understand the general goals of the activities, the class and the teacher should co-operate in determining desirable activities through which the goals can be attained. The well-prepared teacher will anticipate many of the suggestions which the class will make, but he will not destroy the zeal of the group by accepting the suggestions as commonplace. Occasionally a pupil will make a suggestion entirely new to the teacher and perhaps better than any that had occurred to him. Whether the pupils' suggestions are old or new, pupil participation in outlining school activities should be genuinely encouraged, and their contributions should receive full consideration and due recognition. With this point in mind the six sources will be treated in the order in which they are listed above.

1. *Interests and activities of the pupils.* For example, a boy's ability to draw permits him to be the class cartoonist, to illustrate whatever activities the class may be carrying on. The time has passed when children were punished for drawing comic pictures of the instructor. Stamp clubs of today supplement history and geography in a manner which fascinates the average adolescent. Every boy's enthusiasm for airplanes should find expression in his science and mathematics work. Every wholesome interest of the adolescent may become a dominant drive which carries him into school activities, which in turn give him further development.

The key to this source of school experiences is the teacher's specific knowledge of the interests and capacities of each pupil under his direction. Given this knowledge, he can offer his pupil ample opportunity for wholesome, developmental expression, provided he has also analyzed his own teaching field into a series of valuable experiences into which his pupils may turn their energies.

2. *Past experiences of pupils and teachers.* Each year automobile vacation trips take thousands of secondary-school pupils to various parts of North America. Our shifting population causes many children to attend school in several different sections of the country. Almost every classroom has children with a variety of home or even national backgrounds. These and similar conditions make the child's own past experience a rich source of valuable information for his associates. In larger degree the teacher's own experiences, personal as well as academic, afford a wealth of material for classroom use.

3. *The natural, social, and economic environment of the local school.* Every secondary-school subject should be enriched by out-of-school contacts. The science teacher has unlimited resources in nature if he understands natural science; pupils in social studies should understand

every local political and social institution through actual visits and other contacts; and all pupils should appreciate the significance of their basic local industries. The field trip should be used frequently, and activities which arise from its use should be placed on as high a plane as textbook study.

4. *Current records of local, national, and world affairs.* Teachers and pupils should be alert to new findings in their fields of study carried in magazines, newspapers, and such public documents as government reports. The relation of discoveries and events to such school activities as studies in science, history, or literature should be understood by pupils as they progress in their various fields. Thus the current work of the world provides a rich source of worth-while educational experiences.

5. *Analyses of pupil and social needs — present and future.* The teacher may discover a pupil's needs in arithmetic, for example, by giving him a carefully constructed diagnostic test over the phase of arithmetic under study. His errors on the test will indicate what he should learn to bring his arithmetic up to the standard for his grade. The same principle may be used for all secondary-school experiences, although the teacher may have to construct many of the tests himself.¹ This will be especially true of nonacademic activities. The pupil's deficiencies in each case will suggest the activity he should experience.

To define social needs is a more difficult task. One group of persons insists that the schools should maintain society as it now exists; another group insists that civilization is advancing and that the schools should not only keep up with the normal progress of society but also accelerate the progress by conscious effort toward improving the social order. The latter view is held by most educators; yet there is some disagreement as to what the new social order should be. As the desirable changes in society are defined and accepted, it becomes the duty of the teacher to prepare the secondary-school pupil to live under the changed order and to change it further in the desired direction. The activities included in such preparation will depend in large measure upon the changes desired and will be suggested by the definition of those changes. Hence these suggestions become a source upon which the progressive public-school teacher will draw in planning classroom procedures.

6. *Standard fields of knowledge.* Every state or local school system has a prescribed course of study which outlines for the teacher the major portion of his work. The better courses of study direct the teacher to the sources already enumerated, while others adhere closely to the purely academic subject matter. The alert teacher will refuse to be bound by the latter type of course of study.

¹ For a treatment of available tests see C. W. Odell, *Educational Measurement in High School*. D. Appleton-Century Company, Inc., 1930.

Well-prepared textbooks are essential in some school activities and highly valuable in all the major fields of secondary-school work.¹ A good textbook provides an authoritative source of information readily accessible to all. No teacher should limit his work to a single textbook; instead he should draw upon several good texts in his field for a part of his classroom activity. Experience and competence in his field of work will make him more nearly independent of textbooks, but the best textbooks in each field should be available for the pupils as a part of the regular school supplies. In providing free textbooks for a secondary-school group it seems better to purchase eight or ten copies of each of several textbooks than to purchase sufficient copies of one textbook for each pupil to have one, because the multiple-textbook plan permits interchange of books and thereby enriches the offering.

Standard references and authoritative works in given fields constitute another valuable source of content in virtually every field of secondary-school activity. Pupils should understand how to use such works and should be encouraged to refer to them whenever such references will add value to the school activities.

SELECTED REFERENCES FOR FURTHER STUDY

See the references for Chapter XI.

¹ For a treatise upon the textbook see J. B. Edmonson (chairman), "The Textbook in American Education," *The Thirtieth Yearbook of the National Society for the Study of Education*, Part II. Public School Publishing Company, 1931.

CHAPTER XI · Planning Learning Activities and Stimulating Their Performance

(Continued)

GENERAL VIEW OF THE CHAPTER

Provisions for Individual Differences

Preparing Learning Activities

Analysis of pupils' needs

Selection of the major learning experiences, or units

Preparation of the learning units in detail

Sample Learning Units

The Relation between the Learning Unit and Assignment-making

Purposes of the assignment

Standards for the assignment

The Place and Technique of Questioning

The Function of Drill in Learning Exercises

Provision for Emotional Development

Selected References for Further Study

Provisions for Individual Differences

THE need for considering the pupil as an individual has been stressed in this volume. Chapter III emphasized the importance of knowing the learner and of fitting the instruction to his needs, interests, and abilities. The problem of pupil adjustment was treated with the individual pupil in mind. The point of view of the chapter on stimulating wholesome activity was that the pupil, more than the group, must be studied as a basis for motivation; *his* interests and needs must be satisfied.

Several of the applications of the unit idea treated under Division II are distinct plans for the individualization of instruction. The plan integrated in Chapter IX provides for either partial or complete individualization of instruction, and techniques are there described by use of which either might be achieved.

In the present discussion of planning learning activities, provisions designed for meeting individual differences deserve further emphasis because it is during the teacher's planning of the activities that the provisions should be drawn into the picture. Here again the planning referred to includes the major aspects of arranging the instructional program as

well as the minor aspects of outlining activities for one unit or one day's work. Billett found twenty-eight different major provisions in use in as many as a hundred different schools among the 8594 schools reported in his study. Table 10 presents the list of twenty-eight provisions and their frequencies of use.

The twenty-eight provisions are summarized under thirteen headings, each of which may be considered a general practice involving the entire school rather than a specific technique for a teacher to follow in planning instruction; yet each includes numerous procedures for individualizing instruction. The thirteen general practices as summarized by Billett¹ are as follows:

1. Homogeneous or ability grouping.
2. Scientific study of problem cases.
3. Dalton plan.
4. Winnetka technique.
5. Morrison plan.
6. Special classes.
7. Certain interrelated provisions for individual differences: differentiated assignments, long-unit assignments, laboratory plan, individualized instruction, and the contract plan.
8. Problem method.
9. Project method.
10. Out-of-school projects and studies.
11. Variation in number of subjects a pupil may carry.
12. Promotions more frequently than each semester.
13. Psychological studies.

Several of these major provisions have been analyzed in detail in preceding discussions of various applications of the unit idea. The application of others will be apparent in the discussions and sample units which follow.

Preparing Learning Activities

Only a few extremists would contend that teachers should not plan learning activities in advance of their use, and that contention would apply only to teachers of successful experience. Teachers new to the profession will find careful planning essential to their success. This section suggests a general scheme for planning instructional activities which con-

¹ Roy O. Billett, *Provisions for Individual Differences, Marking, and Promotion*, National Survey of Secondary Education, Office of Education Bulletin, 1932, No. 17, Monograph No. 13, p. 12. United States Government Printing Office, 1933.

forms with the unit method presented in Chapter IX. While its major outline may be widely acceptable, the reader should bear in mind the various factors in planning previously discussed and should not accept the illustrations here presented as standards to be followed for all learning activities.

TABLE 10.¹ FREQUENCIES WITH WHICH VARIOUS PROVISIONS FOR INDIVIDUAL DIFFERENCES WERE REPORTED IN USE, OR IN USE WITH UNUSUAL SUCCESS, BY 8594 SECONDARY SCHOOLS

Provision	Use		Use with Estimated Unusual Success		Column 4 Divided by Column 2
	2	3	4	5	
1	Number	Per Cent	Number	Per Cent	6
1. Variation in number of subjects a pupil may carry	6428	75	795	9	0.12
2. Special coaching of slow pupils	5099	59	781	9	.15
3. Problem method	4216	49	444	5	.10
4. Differentiated assignments	4047	47	788	9	.20
5. Advisory program for pupil guidance	3604	42	540	6	.15
6. Out-of-school projects or studies	3451	40	439	5	.13
7. Homogeneous or ability grouping	2740	32	721	8	.26
8. Special classes for pupils who have failed	2612	30	350	4	.13
9. Laboratory plan of instruction	2611	30	323	4	.12
10. Long-unit assignments	2312	27	349	4	.15
11. Project curriculum	2293	27	365	4	.16
12. Contract plan	2293	27	465	5	.20
13. Individualized instruction	2145	25	309	4	.14
14. Vocational guidance through exploratory courses	1911	22	186	2	.10
15. Educational guidance through exploratory courses	1900	22	193	2	.10
16. Scientific study of problem cases	1343	16	146	2	.11
17. Psychological studies	1077	12	70	1	.06
18. Opportunity rooms for slow pupils	946	11	172	2	.18
19. Morrison plan	737	9	175	2	.24
20. Special coaching to enable capable pupils to "skip" a grade or half grade	726	8	114	1	.16
21. Promotions more frequently than each semester	686	8	103	1	.15
22. Remedial classes or rooms	593	7	90	1	.15
23. Adjustment classes or rooms	544	6	55	1	.10
24. Modified Dalton plan	486	6	52	1	.11
25. Opportunity rooms for gifted pupils	322	4	69	1	.21
26. Restoration classes	191	2	24	0	.13
27. Dalton plan	162	2	15	0	.09
28. Winnetka technique	119	1	14	0	.12
29. Other	101	1	—	—	—

¹ From Roy O. Billett, op. cit.

The following steps are listed in the order in which they should be taken by a teacher in any field in planning a year's work.

1. Analyze the needs of secondary-school pupils and relate the given field of knowledge to those needs.
2. Select from the needs the major learning experiences which the individual or group should have during the year. These learning experiences are the units to be carried out by the individual or by the group.
3. Prepare the details of learning units.
 - a. Introduction.
 - b. Pupil's objectives with reference to the learning experience.
 - c. Learning exercises to be performed.
 - d. List of references.
 - e. Statement of outcomes.
 - f. Tests.

The remainder of the chapter is devoted to an elaboration of these three steps and to illustrations of learning units and practices from several fields.

Analysis of Pupils' Needs

Educational practice has not kept abreast of the theory that the secondary-school offering should be based upon the real, vital needs of the pupils. Some of the subject matter still taught has little if any relationship to any present or future need of any secondary-school pupil. Such content should be discarded from the offering. The prospective teacher should realize that he is not to train academicians in the secondary school but that instead he is to use the subject of his major interest as an instrument to meet the needs of adolescents. This viewpoint is the first essential in attacking the problem of planning instructional activities. The pupil, not the subject, should be uppermost in mind.

Progress is being made, however, in discarding worthless content from the secondary-school subjects and in directing the worth-while content toward pupil needs. The whole trend from the formal English procedures of the past to the functional activities of the progressive public school is a case in point. The civics course of the past, in which the Constitution was memorized, has given way to social studies which give practice in citizenship. The mental gymnastics of former "higher arithmetic" have been replaced by practical problems of school and home. The school is less interested than formerly in the pupil's ability to name all the bones of the body and more interested in the pupil's ability to keep well and healthy.

Every teacher should evaluate critically his own field of teaching as far as meeting needs of pupils is concerned and should continue the process of deleting worthless traditions and emphasizing the valuable experiences.

Much research has been conducted to answer in part the question "What are the present and future needs of adolescents?" Many of the research studies are reported by the 1927-1928 Commission on the Curriculum of the Department of Superintendence. For example, in the field of English, Roy Ivan Johnson¹ analyzed the needs of oral and written composition of junior-college students and checked textbooks to determine how well they met those needs. He found the current (1926) textbooks inadequate. Pollock and Curtis² attempted to discover the scientific interests of children as a basis for science instruction. Less basic, though valuable, is the study by Pressey and Fischer, which attempted to determine the items of "place geography most important in understanding history."³ In the review of curriculum research just quoted eight hundred and eighty-nine studies are reported, most of which were conducted during 1931, 1932, and 1933. From the several thousand studies which have been made to determine what should be taught in the schools, there has come much basic material which has already been drawn into the better textbooks. Educational workers have not completed the task of conducting the basic studies or that of incorporating into textbooks the findings of such researches; yet the beginning teacher will find in the improved textbooks much of the work completed and ready for his use in meeting the needs of his secondary-school pupils.

From the foregoing it is evident that a large part of the work of the first step in planning, analysis of pupil needs, has been accomplished. The teacher should supplement this work by careful study of the interests, abilities, and needs of the individual pupils under his direction. At this point the teacher should draw from personal data discussed in Chapter III.⁴ The personal records of individual pupils will analyze for the teacher, in more than general terms, their needs and interests. Pro-

¹ Edwin C. Broome (chairman of the Commission on the Curriculum), "The Development of the High-School Curriculum," *Sixth Yearbook of the Department of Superintendence of the National Education Association* (1928), p. 311.

² *Ibid.* p. 355.

³ Margaret Alltucker Norton (chairman), "The Curriculum," *Review of Educational Research* (April, 1934), Vol. IV, No. 2, p. 152. American Educational Research Association, 1934.

⁴ It is suggested that the student review Chapter III rather thoroughly if he cannot recall specifically the types and uses of data there discussed.

visions for meeting the needs and satisfying the interests should be made in the largest degree possible in the teacher's plan of work. Since it is not possible for each pupil to have a teacher's full attention, it is necessary to combine many of the needs under general headings and to prepare exercises which all pupils may perform and which will meet their needs and challenge their interests. Thus the second step in planning is that of combining into related groups the pupils' needs and interests.

Selection of the Major Learning Experiences, or Units

The activities grouped together to form a complete learning experience, or a learning unit, should be so related that they will form a well-unified segment of the field with which they are associated; yet they should be sufficiently elastic to emphasize pupil needs instead of academic subject matter. It is often convenient to use topical headings in naming the units, although the tendency to follow with bare outlines of content should be avoided.

The major learning experiences selected by the State Committee on Science for North Dakota pupils in general science,¹ for example, are Matter, Energy, Air as a Gas and Other Gases, Water, Forces and Motion, Simple Machines, Work and Energy, Heat, Sound, Magnetism, Electricity, Light, Earth Relations, The Lands of the Earth, The Oceans, and The Atmosphere. In the analysis of each of these learning units the main purpose of satisfying pupil needs was carried out in a highly satisfactory manner.

The eleventh-year course in United States history for the Minneapolis public schools was set forth and subsequently analyzed in the following main learning units:²

The People who made America	Industrial Development
Governmental Development	Financial Development
The Westward Movement	Foreign Relations

A third illustration of selecting the major learning exercises, or units, for a year is drawn from the Minnesota state course of study.³ For seventh-grade social science the following major units are there recommended:

¹ Alfred Victor Overn (chairman), "General Science," *Courses of Study for North Dakota High Schools*. Department of Public Instruction, Bismarck, 1931.

² Unpublished materials.

³ A. C. Krey (chairman, Social-Science Committee), "Social Studies, Seventh and Eighth Years," *The Secondary-School Curriculum and Syllabi of Subjects*, Bulletin No. A-2, p. 11. Department of Education, St. Paul, 1932.

- How the Old World Found the New (2 weeks)
- How the American People Began (1607-1763) (11 weeks)
- How the New World Separated from the Old (1763-1787) (5 weeks)
- How Community Life Has Developed in Minnesota (16 weeks)
- Review (2 weeks)

The beginning teacher will find similar major units for his field of teaching suggested for him in his own state or city course of study. He is not bound in all cases to follow these suggestions and should never permit himself to become enslaved to any detailed plan prepared in advance of classroom use. It is fortunate, however, that much of the work of steps one and two, analyzing pupil needs and selecting major learning experiences, has been carried out by experienced educators and is ready for the teacher to supplement with his own efforts. The teacher's effort and initiative are essential, even when courses of study are mapped out in detail, if his teaching is to be successful in meeting the specific needs of his individual pupils and if it is to be vigorous and lifelike rather than imitative and wooden in character. The main work of planning by the teacher is preparing the details of the learning units, although he should be conversant with the work of the preceding steps to be able to evaluate the work performed in those steps by other educational workers.

*Preparation of the Learning Units in Detail*¹

At the outset two points should be clearly understood: First, the teacher should realize that many details of classroom procedure cannot be planned in advance of classroom use because they arise from the group discussions or from new interests which develop as students pursue their activities; secondly, some of the details which are definitely planned in advance should be discarded if better activities develop after the work has been started, that is, a prearranged plan should not enslave the teacher or the class but instead should yield to better practices which may arise spontaneously during the progress of any given unit.

The scheme here described is not claimed to be the best. It has been found an effective method of applying the unit plan presented in a preceding chapter. Each of the six aspects of the scheme will be presented; then complete illustrations of this scheme and others will be drawn from actual classroom practice.

¹ Many of the suggestions in the earlier chapter on the workbook apply to this section because a good workbook consists of a series of learning units prepared in detail.

1. *Introduction.* The introduction should consist of a brief paragraph stated in language easily understood by the pupil. The statement for the first unit of a year's work should be fuller than those for succeeding units and should make the pupil aware of the significance of the chain of activities which he will carry out during the year in the given field. The purpose of the introduction of each succeeding unit is to link the activities already completed with those about to be pursued. Thus the introduction is a carry-over from the Dalton plan, described in an earlier chapter.

2. *The pupil's objectives.* The purposes a normal adolescent might expect to achieve through the activities should follow the introduction and should be stated in his language. The statements may be drawn from those made by previous classes as well as from the teacher's knowledge of the values to be derived from the activities of the unit. As the unit is attacked by an individual pupil or by a group, opportunity should be given for approval or rejection of the objectives listed for the unit and for listing others any pupil might suggest. In mimeographed or printed reproductions of units ample space should be left for the new objectives which are suggested in this manner. Some teachers permit the pupils to prepare all their objectives during the introduction-and-attack stage of the unit; others prefer to state most of the pupil's possible aims in advance. Either approach causes the pupil to become conscious of the purposes of the activities about to be performed; and if he accepts those purposes, the procedure becomes a powerful motivating force.

3. *Learning exercises.* Practice varies in the building of learning exercises to be performed during the study-and-work stage of the unit. Some teachers prefer to have their pupils suggest the activities which will enable them to attain the objectives of the unit; others are less optimistic and prefer to state the larger part of the exercises in advance. Under ordinary conditions many of the exercises should be worded by the teacher and mimeographed or printed in advance to form an outline for the study-and-work period. Freedom should be given the pupil, however, to add as many as he may care to originate in each of the four levels of exercises described below, and spaces should be left for him to insert them in any mimeographed or printed outline of exercises.

The learning exercises, according to the scheme here presented, should be upon four levels of increasing difficulty. The first level is that of the pupil's own personal experiences. Exercises on this level will cause him to associate the experiences about to be gained with any of his past experiences which are related to the new. Such exercises will give the pupil familiarity with the unit and will reduce the lost motion which usually retards the doing of anything that is new to the individual.

The next higher level of exercises causes the pupil to seek further information from various sources — books, current publications, persons,

places which may be visited, and experiments which may be performed. At this level the learning exercises stimulate reading, visitation, and experimentation, and the consequent activities build upon the past experiences toward the objectives the pupil has set for himself. This level carries the pupil through the study-and-work stage of the unit.

The third level of learning exercises causes the pupil to apply in the most practical way possible whatever additional knowledge he may have gained from the activities of level two. This level takes the pupil into the integration-and-application stage of the unit. Here his knowledge actually functions in his life. He uses it to attain the purposes of the unit.

The fourth level of exercises gives the pupil opportunity for the expression of any creative ability he may possess. It consists of exercises which will challenge the best ability of the most capable pupil. Also, this level permits the pupil to continue his study of any problem of particular interest to him. It is thus the highest level of learning, the creative level, and carries the integration-and-application stage of the unit beyond the practical as far into the theoretical as the pupil can go.

The learning exercises at all four levels should meet certain standards. Twelve terms descriptive of well-prepared learning exercises are as follows :

- a. Clear.* The learning exercise should be stated in clear, direct language. In wording the exercises the teacher should consider the pupil's vocabulary.
- b. Definite.* A clear-cut statement of some definite task to be done is an excellent form of learning exercise.
- c. Purposeful.* Every learning exercise should be directed toward one or more of the objectives listed at the beginning of the unit. Whenever possible, the relation of exercise to objective should be evident from the statement of the task to be performed.
- d. Appealing.* Some interest should be appealed to in each exercise. The tasks should be things adolescents are interested in doing, so far as possible. They should not rely entirely upon their purposefulness for their motivating power. Also, the phraseology should be as appealing as possible.
- e. Varied.* A large number of different kinds of tasks for individuals and for groups should be suggested by the exercises. Also, the manner of stating the exercises should not be monotonous, but varied and challenging.
- f. Of proper difficulty.* A task that requires no effort is of no value, yet one that is beyond the ability of every pupil in the group is equally valueless. All exercises should be within the range of the group. This does not imply that all should be of the same difficulty. Such should not be the case.

- g. Adapted to various abilities.* Instead of making all the tasks of approximately the same difficulty the teacher should suggest some simple enough for the weakest pupil to perform successfully and others of increasing difficulty until the best ability of the ablest pupil will be challenged.
- h. Individualized.* The specific abilities or special aptitudes of individual pupils should be given opportunity for expression through exercises suggested especially for them. In another sense the whole procedure being presented in this section is a plan for individualized instruction if the teacher is in position so to apply it.
- i. Socialized.* Since most schools operate upon the class basis, many of the exercises should call for group work and should definitely encourage socializing procedures.
- j. Of reasonable length.* The amount of time required for an exercise should be proportionate to its value, but none should be unreasonably long. Even if interest does not lag, other work will suffer if any exercise is pursued beyond reasonable limits.
- k. Optional.* A sufficient number of exercises should be suggested to permit pupils to choose those they consider of value in attaining the objectives of the unit. It may be understood that they will perform a half or three fourths of the exercises in a unit, but complete freedom should be given within such a range. Also, pupils should be given the opportunity to substitute original exercises for those suggested in the learning unit, provided they are equally effective in attaining the desired goals.
- l. Self-checking.* So far as possible, the exercises should be such that the pupil can check his own performance of them. This criterion cannot always be attained, but should be applied whenever feasible.

4. *List of references.* As the teacher prepares a learning exercise, he should list specific references which will help the student to perform the task. After all exercises have been prepared the references should be assembled in alphabetical order, with chapters and pages specified and the list appended to the learning unit. Pupils should understand from their general instructions that their work should not be limited to the suggested references. They should be encouraged to add to the list whatever particularly good references they find not included in it.

Various time-saving devices may occur to the teacher in listing references. For example, the local-library call number of each reference may be mimeographed beside the reference, and the number which designates the position of a reference in the list may be placed in parenthesis after the exercises for which it is of value.

5. *Statement of outcomes.* As the next section of a learning unit a concise statement of outcomes should be prepared. The statement should summarize the benefits which the students should have received by performing the learning exercises. The outcomes will closely parallel the objectives stated at the outset of the unit. The chief value of the statement of outcomes is the aid it gives the student in summarizing his work on the learning unit.

6. *Tests.* It is optional with the teacher whether or not to include the test in the mimeographed material handed the pupil. From a theoretical standpoint the pupil should be privileged to test himself, since he alone should be responsible for his own learning. But from a practical standpoint the custom of giving marks for schoolwork still persists, and the marks are determined by test scores. Consequently most teachers prefer not to give pupils free use of the tests and do not include them in the mimeographed materials.

The tests serve several important functions in teaching and should be very carefully prepared for each learning unit. Even though the teacher may not include them as a part of the duplicated learning unit, they aid in an essential part of the teacher's work with any unit because they make possible both diagnosis of error and measurement of final achievement, thus completing the fourth stage of the learning-unit procedure, appraisal of outcome.

Inasmuch as the major portion of Chapter XIV is devoted to instructions for preparing objective tests, treatment of that problem here is unnecessary.

Sample Learning Units¹

The following learning unit from the co-ordinated science and mathematics approach to the study of the consumer² illustrates the various details of the plan just discussed.

THE COST OF ELECTRICITY IN THE HOME

VIEWPOINT

All members of society are consumers of numerous commodities. Electricity is becoming one of the most important sources of light, heat, and power in the home, and as consumers of this commodity all persons face certain definite problems regardless of their economic position.

¹ For samples of additional units prepared in all details according to the foregoing discussion the student is referred to the writer's *Learning Units in Secondary School Teaching*. Perine Book Company, Minneapolis, 1935.

² Made available through the courtesy of Dr. Rudyard K. Bent, University of Arkansas, formerly chairman of the Science Department of the University of Minnesota High School.

STUDENT'S OBJECTIVES

General: A sufficient understanding of the nature of electricity, and adequate knowledge of electrical appliances to enable one to become a more efficient consumer of electricity.

Specific:

1. Knowledge of the various electrical measuring instruments and units.
2. Facility in the application of measuring units to electrical appliances.
3. An understanding of how electrical energy can be used for light, heat, and power.
4. The ability to read an electric meter.
5. The ability to compute the cost of electrical appliances and to check bills for electricity.
6. The acquisition of habits of thrift in consuming electricity.

LEARNING EXERCISES

A. Relating one's own experience to the problem :

1. Make a list of the appliances in your own home and record the amount of current required for each.
2. What is the chief form of electric energy used in your home: lighting, heating, or motive-power? Record the approximate amount each type is used for one week.
3. Find the cost of a KWH of electricity from your latest electric bill and note the per cent of discount allowed for payment on or before a certain date.
4. Using your latest electric bill as an average, compute the amount which could be saved in one year by payment within the discount dates.
5. Other learning units (for the student to suggest) :
 - a.
 - b.
 - c.

B. For mastery of the references pertaining to the problem :

6. Learn to compute the cost of operating an electrical appliance when the volts and amperes, or watts, are known. (Use the rate you found from your own electric bill.) References : 5, 9, 10, 14.
7. Determine the kinds of appliances which cost the most to operate: heating, lighting, or motive-power. References : 5, 11, 12.
8. Learn to read your own electric meter. References : 1, 6, 9, 10.
9. List suggestions for the efficient consumption of electricity. Observe if these suggestions are being practiced in your own home. Reference : 5. (See also, if available: *Consumers' Research Bulletin*.)
10. Other learning exercises of this type :
 - a.
 - b.
 - c.

C. Applying the problems to situations in the home:

11. Apply your suggestions of Exercise 9 for one month and observe the reduction, if any, in your electric bill.
12. Check your own electric meter at a time when all electricity in the home is turned off, to see if it is registering because of a leak.
13. Estimate the number of hours each electrical appliance in your home is used during a month. Then compute the cost of operating each appliance for one hour, for one month. Check this amount with your electric bill. References: 1, 10, 14.
14. Compare the costs of heating your home by electricity and by coal at present rates. Reference: 5.
15. Connect several appliances, e.g., hot plate, fan, light bulb, to a watt meter and compare the reading with the ratings on the appliances. Reference: 5.
16. Other learning exercises of this type:
 - a.
 - b.
 - c.

D. For further study:

17. Watch your daily newspapers for articles concerning:
 - a. Electric rates in your own city compared with others.
 - b. The generation of electrical power.
18. Secure a price list of various fuels from local dealers, e.g., coal, gas, wood, oil, and compare the costs with that of electricity on a B.T.U. basis. Reference: 5.
19. Replace a heating element in a broken appliance. Reference: 5.
20. Make a bar graph of the values found in exercise 18. Reference: 9.
21. Other learning exercises of this type:
 - a.
 - b.
 - c.

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OUTCOMES

1. Consciousness of one's place as a consumer.
2. Specific thrift habits in the use of electricity.

A somewhat different approach to the purpose of the unit plan is illustrated by a unit drawn from the North Dakota state course of study.¹

FORCES AND MOTION

(Time — Two weeks)

UNIT OBJECTIVES

- *To understand the principles of force, motion, and inertia.
- *To develop a good attitude toward school work by diligent search for the answers to the problems and questions that arise in connection with the study of forces and motion.
- To develop a permanent interest in the laws of forces and motion.

SPECIFIC OBJECTIVES

- *To understand that force is the action of one body upon another in the form of a push or pull.
- *To understand that a force if strong enough to overcome the inertia of a body, will either give it motion, or stop its motion, or change the direction of its motion.

¹ Alfred Victor Overn, op. cit. p. 26.

* The asterisk is placed before those objectives which are considered minimum essentials.

*To learn the law of inertia and appreciate its practical value in every-day life.

*To understand that a force is always exerted in a straight line.

*To understand why a body has weight.

*To understand how the force of buoyancy in water and air is exerted.

*To appreciate the meaning of center of gravity.

*To understand how the pull of gravity affects air, water, and solids.

*To understand speed as the distance traveled in a unit of time.

*To understand that velocity is the speed of a body in a given direction.

*To summarize the principles of force, inertia, and motion, in order to prepare to pass the test in this unit.

To appreciate some of the practical ways in which forces and motion are used.

To understand component and resultant forces as applied to flying kites and airplanes.

PUPIL ACTIVITIES

Make up your own questions about the things you do not understand and would like to learn more about in the subject of forces and motion.

Look in the index in various reference texts under "forces" and "motion" to find other questions that will suggest additional points.

Present the questions which interest you most, to the group, and volunteer to find answers for any of them that are assigned to you.

Bring to class as many problems as you can from your daily activities which you think could be worked by applying the principles of forces and motion. Let the teacher of the class decide whether to discuss these problems. Look up references to help you solve them for yourself.

Study Galileo's experiment with falling bodies and Torricelli's experiment in the amount of air pressure at sea level. See reference 9 in regard to the force of gravity.

Work problems which you have found in the references to show how well you have mastered the twelve objectives of this unit. Examine each objective and test yourself to find out whether you think you have mastered it.

DESIRABLE OUTCOMES

A thorough understanding of the meaning of force and of the laws of motion.

An appreciation by the pupils of as many as possible of the practical ways in which forces affect their daily lives.

The ability to explain and illustrate the principle of buoyancy in water.

A knowledge of the ways in which the force of gravity acts upon solids, liquids, and gases. (The teacher should divide this into several more specific outcomes.)

A knowledge of how the force of compression of gases may be applied in the cooling or heating of houses.

The ability to solve problems like the following: if dropped from the same height at the same time, will a pound bag of feathers or a pound bag of nails reach the ground first? Why?

The ability to diagram and explain a simple example of component and resultant forces: like forces which act when a train passes around a curve in which the outer rail is raised higher than the inner one.

An appreciation of the importance of inertia and velocity in such useful devices as the gyroscope and the flywheel of a gasoline engine. The ability to explain what is meant by saying that they have inertia and velocity.

REFERENCES

New general science textbooks as follows:

1. The meaning of force: H, CC, CCT, PB. (Note by author: Code letters refer to a general reference list previously distributed to pupils.)
2. Laws of motion: HW, H, CC.
3. Practical uses of forces and motion: H, RT, WC, CCT, PB.
4. Practical value of inertia: HW, H, WC, CC, CCT, PB.
5. Force exerted in a straight line: H, CC, CCT.
6. Force of buoyancy in water and air: H, WC, CC, PB.
7. Center of gravity: H.
8. Component and resultant forces: H, WC.
9. Pull of gravity: RT, WC, CC, CCT, PB.
10. Compression of air: RT, WC, CC, CCT, PB.
11. Speed and velocity: CCT, consult an elementary text in physics or a good cyclopedia.

SOURCES OF PROBLEM-PROJECTS

1. Set a bicycle upside down. Spin one wheel rapidly. Then try to tip the bicycle to one side. The spinning wheel acts like a gyroscope. How may you explain this resistance against tipping by the law of inertia?
2. Why is it easier to keep a bicycle from falling over when going than when standing still?
3. Get some steel balls or glass or flint marbles of assorted sizes. Then experiment on a smooth level table top, by rolling a marble down a small inclined plane so that it will strike a stationary marble on the table. Note the results. Illustrate the law of inertia by having the marbles, one by one, impart their motion to two or three other balls of different masses.

SUGGESTED EQUIPMENT FOR THIS UNIT

- | | |
|--|--|
| 1. Several steel balls (1 inch). | 5. Small piece of wood. |
| 2. Several blocks of wood
(2" × 2" × 6"). | 6. Several irregular bodies of metals. |
| 3. Spring scales. | 7. Toy boat. |
| 4. Overflow can. | 8. Accurate balance scale and brass weights. |

Still other deviations in practice are shown in the next illustration. Billett first differentiates between a unit and a unit assignment as follows: "The *unit* is best regarded as a concept, attitude, appreciation, knowledge, or skill to be acquired by the pupil, which, if acquired, presumably will modify his thinking or his other behavior in a desirable way";¹ whereas "The *unit assignment*, on the other hand, consists of the suggested or required activities and experiences planned by the teacher to enable the pupil to master the desired concept, attitude, appreciation, knowledge, or skill." As an illustration Billett later² presents the following unit and unit assignment which had been submitted to him by the Summit High School of Summit, New Jersey :

I. The unit :

A. Major conception. — Burning and other forms of oxidation are chemical reactions in which oxygen combines with some other substance to form a new substance known as an oxide. Heat is always produced.

B. Minor conceptions. —

1. Fire has played an important role in the development of mankind.

(a) There are four stages in man's control and use of fire.

(b) Fire plays some part in nearly every physical convenience which we have.

2. There must be very definite conditions for burning.

(a) The substance must be combustible, i. e., something with which oxygen will combine.

(b) The substance must be in contact with oxygen, which is a colorless, odorless, noncombustible gas.

(c) Its temperature must be raised to the kindling point, a point at which oxygen combines rapidly enough to produce perceptible heat and light.

3. The products of burning or oxidation are oxides.

(a) Their weight equals the weight of the substance burned plus the weight of the oxygen used.

(b) Some are solid, some liquid, some gaseous.

(c) Some are soluble, others insoluble.

(d) Those which are soluble form acids on going into solution.

4. Fire was believed by the early chemists to be an element and burning a "flowing out" process.

(a) The true nature of burning was not discovered until the scales were used in quantitative experimentation. At this point modern chemistry began.

(b) Priestley and Lavoisier solved the problem.

¹ Roy O. Billett, op. cit. pp. 357-358.

² Ibid. pp. 372-376.

5. There are many manifestations of oxidation other than ordinary burning.
 - (a) Rusting is slow oxidation which takes place at a temperature below the kindling point. The same total amount of heat is produced as in the case of burning.
 - (b) Animal heat is produced by slow oxidation of the carbon content of the assimilated food.
 - (c) Spontaneous combustion results when conditions are such that heat from slow oxidation raises the substance to the kindling point.
 - (d) A finely divided combustible substance when mixed with oxygen and raised to the kindling point produces explosive burning.
6. Oxidation may be stopped by removing any one of the three conditions for burning, namely, combustible material, oxygen, or kindling temperature.
 - (a) Water eliminates oxygen and cools the surface below the kindling temperature.
 - (b) Most chemical fire extinguishers generate carbon dioxide gas, which is heavy, noncombustible, and a nonsupporter of combustion.
 - (c) Some extinguishers use a very volatile noncombustible and non-inflammable liquid.
 - (d) Rusting is prevented by covering the substance with a protective coating which resists the action of moisture, oxygen, or other corrosive gases.
7. Oxides may be changed back to the original substance by an action known as reduction.
 - (a) A substance used as a reducing agent combines with the oxygen of the oxide, replacing the original substance.
 - (b) With reduction there must always be oxidation.

II. The assignment :

Problem 1. What is the origin and importance of the use of fire? Read :

- (a) The Story of Fire, Prometheus, pages 1-22.
- (b) Implications of Fire, Prometheus, pages 23-29.

Problem 2. What are the chemical conditions required for burning?

(a) Experiments —

- (1) Place a piece of charcoal about the size of a bean and a similar piece of slate in an iron spoon and heat for about five minutes. Repeat for the same length of time in a porcelain crucible with cover on. Make a parallel record of all observations in your notes.
- (2) Carefully weigh 5 grams of powdered iron in the crucible. Heat, first gently for about a minute, then intensely. Keep the iron

stirred loosely with the handle of the deflagrating spoon while heating until the iron ceases to glow. While the action is going on note the effect of blowing the iron gently as you would blow a fire to make it burn. Weigh carefully again. Record your results in a tabular form similar to that at the bottom of page 11 of your test. Compare the color of the remaining substance with the original iron. Test it with a magnet.

Repeat the above experiment using 1 gram of powdered zinc carefully weighed in an iron spoon. Exercise care not to lose any of the materials before final weighing.

(b) Demonstration —

- (1) One member of class to volunteer and demonstrate B and C, paragraph 26, page 24, Figure 19.

(c) Readings —

- (1) The Slice of Toast, Fabre, pages 26-41.
- (2) Air and Combustion, Fabre, pages 211-223.

Problem 3. What is the nature of the products of burning or oxidation? (Assigned readings, experiments, and demonstrations as above.)

Problem 4. How was the true nature of burning discovered? (Assigned readings.)

Problem 5. What is the nature of the effects of slow oxidation as (1) rusting; (2) animal heat; (3) spontaneous combustion? (Assigned readings, experiments, and demonstrations.)

Problem 6. How may oxidation be prevented and oxides reduced? (Assigned readings and experiments.)

III. Related activities:

A. Exhibits —

POINTS

- 1. Exhibit material mounted on a board to show the effectiveness of a number of protective coatings 30
- 2. Exhibit showing results of laboratory experiments 15
- 3. Exhibit of materials used for protective coatings 20

B. Posters —

- 1. Fire prevention posters 20
- 2. Poster showing the advance made between the primitive and the present use of fire 20

C. Scrapbook —

- 1. Newspaper and magazine articles and pictures related to fire, explosions, corrosion, and other phases of the unit 25

D. Graphs —

- 1. Bar graph showing the losses due to fire over a period of years 20
- 2. Bar graph showing the estimated losses due to rust over a number of years 20

(Consult the World Almanac for facts.)

E. Advertisements. — Write an advertisement for —

1. A paint.
2. A lacquer.
3. Some metallic coating.
4. A fire extinguisher.
5. Stainless steel.

F. Slogans —

POINTS

- | | |
|--|----|
| 1. For fire prevention | 10 |
| 2. To safeguard against spontaneous combustion | 10 |
| 3. Advocating use of protective coatings | 10 |
| 4. For prevention of dust explosions | 10 |

(If the slogan is accompanied by a picture it will receive the added credit of a poster.)

G. "Anticdotes" and other "dotes" —

- | | |
|---|----|
| 1. Jokes, personal or otherwise, relating to chemistry, the laboratory, or the classroom. Jokes must be either new or old ones made new. Each | 5 |
| 2. Limericks | 5 |
| 3. Poems of not fewer than 20 lines | 10 |
| 4. A short play or dialogue | 15 |
- (1) Conversation between a phlogistonist and a modern chemist.
 (2) Simple play involving two primitive men with fire.
 (3) A conversation between Priestley and Lavoisier. (Must give a lesson in chemistry to receive credit.)

H. Portraits —

- | | |
|------------------------|----|
| 1. Lavoisier | 20 |
| 2. Priestley | 20 |
- (Portraits must be about 10 inches in length and must be accompanied by a brief sketch of the man's accomplishments in chemistry.)

I. Original contribution. — Any original contribution not suggested here will receive credit according to merit.

IV. Requirements for the various assigned marks. The total number of credit points which you earn will determine your mark on the unit. For a mark of A you must have 130 points; for a mark of B, 110 points; for a mark of C, 90 points; for a mark of D, 70 points. Credit may be earned as follows:

A. The unit test. — (Consisting of 130 true-false statements and 20 completion questions.)

- | | |
|---|----|
| 1. For a mark of A on the unit test | 70 |
| 2. For a mark of B on the unit test | 60 |
| 3. For a mark of C on the unit test | 50 |
| 4. For a mark of D on the unit test | 40 |

B. A general report on the unit of from 300–600 words. The report will be marked on the degree to which it shows organized understanding of the unit.

- | | |
|--|----|
| 1. For a mark of A on the report | 60 |
| 2. For a mark of B on the report | 50 |
| 3. For a mark of C on the report | 40 |
| 4. For a mark of D on the report | 30 |

C. Points for related activities as indicated above.

In the illustration just given it may be noted that the objectives are not stated as such but are implied in the "conceptions" which the pupil is to acquire. Another interesting deviation is the scale of scores to parallel marks of A, B, C, and D on the unit test. This unit assignment also employs the point system, in which a certain specified number of points toward a mark on the unit is given for performing the related activities or for preparing a general report on the unit. The point system is unquestionably a motivating force but may develop a serious weakness unless pupils are prevented from emphasizing point-winning more than the primary values of the activities. It is not recommended to the reader.

The several sample units presented above not only illustrate the more important aspects of planning learning activities; they also make it quite clear that the idea need not conform to any one set scheme. With experience the teacher should draw from various forms of planning, including his own initial attempts, numerous ideas with which he should gradually develop his own system of planning.

The Relation between the Learning Unit and Assignment-making

The making of good assignments has long been considered an essential part of teaching. Long experience has developed definite purposes and standards for assignment-making which are of value to every teacher.¹ The following discussion unites learning-unit procedures and assignment techniques. The treatment attempts to emphasize the purposes and standards of assignment-making and at the same time to show clearly that a well-prepared learning unit is a written assignment of the very best type.

¹ For a particularly good treatment of the assignment see Gerald Alan Yoakam, *The Improvement of the Assignment*. The Macmillan Company, 1932.

Purposes of the Assignment

The main purposes of the classroom activity of both teacher and pupil during the assignment-making periods may be stated as follows :

1. To discover pupil needs.
2. To set objectives which will meet those needs.
3. To anticipate and to remove difficulties.
4. To select activities which will achieve the objectives.
5. To stimulate eagerness to perform the activities.
6. To plan the individual's activities.
7. To launch the attack.

All seven purposes of assignment-making are achieved in a well-constructed learning unit. The discovery of pupil needs is the first step in planning learning activities. This point has been elaborated earlier in the chapter. Setting the objectives is a distinct part in preparing a learning unit, as explained above. The instructions for study, either oral or written, as a part of the statement of learning exercises, call the pupil's attention to danger spots and prepare him to meet the difficulties effectively.

Purpose 4, selection of activities to meet the objectives, is accomplished in detail by the learning exercises. As the pupil originates or accepts the objectives of a learning unit and as he aids in suggesting activities by which his objectives may be attained, he becomes eager to get started. Each pupil is privileged in the learning-unit procedure to help to plan his individual activities, since he may originate exercises and choose from those suggested by the teacher any others which he considers worth while. Launching the attack, the final purpose of the assignment, is achieved either individually or in groups as the pupil or the class begins work on the exercises. To facilitate the attack, the teacher frequently makes himself available for answering questions.

Standards for the Assignment

The characteristics of good assignments listed in the first column on the next page were found by Yoakam¹ to be those most frequently mentioned by eighteen writers. The attributes in the second column were added by the same author after a survey of the writings of "forty writers on the assignment of lessons."

¹ Ibid. pp. 89-91. By permission of the Macmillan Company, publishers.

Definiteness	Vivid
Clearness	Detailed
Interest	Arbitrary
Stimulation	Unified
Inspiration	Flexible
Exposition	Effective
Preparation	
Direction	
Discrimination	
Individualization	

The sixteen terms, with the exception of "arbitrary," may be considered descriptive either of a good assignment or of a good learning unit. "Definiteness," "clearness," "interest," and "individualization" were discussed above among the twelve criteria of learning exercises. The following definitions of the other characteristics apply equally well to learning units and to traditional oral assignments.

1. *Stimulation.* A suggested activity should be thought-provoking and challenging. It should appeal to the pupil's curiosity, to his desire to achieve, to a well-established interest, or to some other potential source of action. If this is accomplished, the desired response will occur as certainly as the electricity lights a room when the switch is turned, provided in both cases actual contact is made with the source and all circuits are normal.

2. *Inspiration.* The teacher's enthusiasm is an important factor either in making oral assignments or in presenting learning units, but the enthusiasm will be more likely to spread to the group if the suggested exercises themselves invite enthusiastic response.

3. *Exposition.* Instructions should make clear to the pupil what is to be done. Difficulties should be indicated and means for overcoming them suggested. Learning exercises should be stated in terms which cannot be misunderstood or confused.

4. *Preparation.* Learning exercises or discussions which best prepare the pupil for new features of the learning experience are those which tie up with his past experiences. They are the exercises on the first level, discussed on page 257. Time is well spent which is devoted to adjusting the pupil's mental and emotional structure to the tasks about to be performed.

5. *Direction.* The details of the oral or written assignment constitute a set of directions to the pupil which guide his progress in the learning experience. Thus direction is an essential feature of either type of procedure: the oral assignment or the written learning unit.

6. *Discrimination.* Directions for activities should encourage the pupil to select the activities of the greatest value to him. In a wider sense the

teacher should suggest only the activities that carry relatively high potential values. With both pupil and teacher thus exercising their powers of discrimination the value of the work should continually rise.

7. *Vividness*. Illustrations should be presented either orally or in written form to emphasize outstanding facts. Colorful anecdotes likewise vivify introductions to exercises and should be used frequently, especially in oral form. The exercises themselves should call for activities that will give vivid, lasting impressions.

8. *Detail*. Minute details of new learning processes are essential to a correct start by the pupil. The written exercises should be supplemented orally to answer all questions the pupils ask.

9. *Arbitrariness*. It was implied above that "arbitrary" should not be included among the terms descriptive of good units or good assignments. The superior teacher does not arbitrarily impose tasks upon pupils. He secures their reaction and encourages their co-operation. This practice is the opposite to the dictatorial and imperious procedures which once were common in many schools. Imposed tasks are done without the spontaneity and enthusiasm upon which learning thrives. The chances are rather great that self-selected tasks, performed with zeal, result in better retention and greater development than tasks arbitrarily set by another individual and performed under duress.

10. *Unity*. The essential quality of a well-prepared learning unit is that it be a well-rounded, unified experience. Similarly an oral assignment should leave the pupil with a clear overview of the entire experience about to be entered. Parts should be so interrelated that together they form a meaningful and complete learning experience.

11. *Flexibility*. There should be no rigid plan which forces all to adhere regardless of interest or ability. The purpose of the experience is to satisfy the pupil's needs. His needs will vary with his interests and abilities. Hence the unit or assignment should be flexible enough to meet the ranges of interests and abilities represented in the group.

12. *Effectiveness*. Procedures that have all the foregoing characteristics will most likely attain the ultimate criterion of effectiveness. Any procedure which does not achieve the end toward which it is directed should be cast aside. Practical use, followed by careful measurement of results, will reveal to the teacher his most effective procedures. These should be made permanent parts of his classroom practice.

The Place and Technique of Questioning

Questioning deserves first rank among the legitimate teaching devices designed to provoke thought and to stimulate pupils to profitable activity. It is indispensable in plans of individualized instruction as well as in plans

which teach pupils in groups. The art of questioning has been called the chief prerequisite of good teaching. In the planning of instruction, therefore, careful thought should be given to the part that questioning will play in carrying out the units being planned. What are the purposes served by questioning, what are the characteristics of good questions, what are the general types of questions, and what skills in the asking of questions must the teacher develop? Answers to these points should be in the teacher's mind as he plans his instruction, and that knowledge should guide him later as he directs the pupils in the activities which he has planned. These phases of the general problem of questioning are treated in the following sections. The student should understand that while the following discussion treats the question in relation to the unit plan, the values described are not limited to that plan.

The Purposes of Questioning

Questioning has definite purposes to fulfill during each of the four stages of the complete learning experience, or unit.

In the introduction-and-attack stage, the teacher by questioning discovers the interests of the pupils which are related to the unit and the special abilities of individual pupils which may be developed while being used for the benefit of the group. He ascertains through oral or written questioning the amount of information about the unit already possessed by the individual or the group. Skillfully framed questions at this stage arouse new interests and concentrate attention upon the proposed study. They suggest activities and sources of information, and aid in setting the limits of the unit. In fulfilling these purposes during the first stage of the unit, proper questioning aids materially in laying the foundation for subsequent successful pursuit of the unit.

The purpose of questioning during the study-and-work stage is to stress important points, to stimulate activity, to check errors, to direct thinking, to encourage contributions by pupils from their own experiences, and to provide practice and drill.

During the integration-and-application stage of the unit the question is invaluable as an aid to the organization of materials. It may be used by the teacher in training pupils to discriminate. It frequently becomes the teacher's chief means for directing discussion intended to develop desirable emotional responses.

Finally, in appraising the outcomes the question plays the leading role both in review and summary and in oral and written testing.

Criteria of Good Questions

The nature of the question varies according to the purpose it is intended to serve. For example, in the early stage of a problem or unit the question might well partially suggest its answer, whereas in the testing stage such a question would defeat the purpose of testing. The following standards, however, may be applied to questions in general.

1. *The question should be clear.* This standard implies simplicity in sentence structure, lack of ambiguity, absence of words unknown to the pupil, and, if oral, distinctness in speech and proper volume. If the question is not understood by the pupil, the intended mental contact cannot be made and the pupil's response will not be indicative of his mental status regarding the point. This standard of clarity is therefore fundamental.

2. *The question should be brief.* Lack of brevity frequently results in lack of clarity. Even when length of statement would not confuse the student, conciseness of wording is usually to be preferred because of the saving of time involved.

3. *The question should be challenging.* It should stimulate mental activity of some vigor rather than simple denial or agreement. As a general rule, association of ideas rather than mere recall should result from the question.

4. *The question should fit the individual who is to answer it.* While framing the question the teacher will usually have in mind the pupil who is to be called upon and should be guided by that pupil's abilities and interests as he words the question.

5. *The question should be worded so as to achieve the purpose for which it is intended.* This standard is obviously fundamental. It is the ultimate test of the question. If a question achieves a desirable purpose, it is a good question.

Types of Questions

Two general types of questions are those which require the student to state a fact and those which require him to use facts and state the result. The first type is called the factual, memory, or recall question. The second type is usually referred to as the thought or problem question.

The factual question is used with profit at all stages of the four-stage learning process. At the outset of a unit it will bring forth information relevant to the problem and thereby link the pupil's experience to the unit. During the study-and-work sessions both pupil and teacher will ask numerous factual questions to clear up specific points and to provide occasional quick review as the plan of work is being developed. Much specific recall is essential to the success of the integration-and-application stage and can best be stimulated by pointed recall questions. Such ques-

tions are the chief means of determining how well one of the outcomes of learning, factual information, has been achieved.

It should be clearly understood, however, that the recall question is of less importance in the teaching process than the thought question. The question which provokes thought is the chief means by which a teacher stimulates pupils to use the facts they have acquired, and in importance it differs from the factual question as greatly as the ability to use knowledge differs from sheer possession of knowledge.

Through long experience the teaching profession has developed a number of kinds of problem or thought-provoking questions all of which should become parts of the teacher's equipment to be drawn into his plans for classroom work. The following list resulted from a rather wide survey of thought questions used by teachers:

1. *Selective recall, basis given.* Name the Presidents of the United States who had been in military life before their election.

What do New Zealand and Australia sell in Europe that may interfere with our market?

2. *Evaluating recall, basis given.* Which do you consider the three most important American inventions in the nineteenth century, from the standpoint of the expansion and growth of transportation?

Name three statesmen who have greatly influenced economic legislation in the United States.

3. *Comparison of two things, on a single designated basis.* Compare Eliot and Thackeray in ability in character delineation.

4. *Comparison of two things, in general.* Contrast the life of Silas Marner in Raveloe with his life in Lantern Yard.

5. *Decision, for or against.* Whom do you admire the more, Washington or Lincoln?

6. *Causes or effects.* Why has the Senate become a much more powerful body than the House of Representatives?

What caused Silas Marner to change from what he was in Lantern Yard to what he was in Raveloe?

7. *Explanation.* Use of the exact meaning of some phrase or statement in a passage.

8. *Summary.* Of some unit of the text or of some article read.

9. *Analysis.* (The word itself is seldom involved in the question.) What characteristics of Silas Marner make you understand why the Raveloe people were suspicious of him?

Mention several qualities of leadership.

10. *Statement of relationships.* Why is a knowledge of botany helpful in studying agriculture?

11. *Illustrations or examples* (your own) of principles in science, construction in language, etc.

12. *Classification*. (Usually the converse of No. 11.) What is the principle involved here? What is the construction? To what class or genus does this individual belong?

13. *Application of rules and principles in new situations*.

14. *Discussion*. Discuss the Monroe Doctrine.

15. *Statement of aim*. The author's purpose in his selection or organization of material.

What was the purpose of introducing this incident?

16. *Criticism*. As to the adequacy, correctness, or relevancy of a printed statement or of a classmate's answer to a question on the lesson.

17. *Outline*.

18. *Reorganization of facts*. (A good type of review question for purposes of training in organization.) The student is asked for reports where facts, from different organizations, are arranged on an entirely new basis.

19. *Formulation of new questions*. Problems and questions raised.

What question came to your mind?

20. *New methods of procedure*. Suggest a plan for proving the truth or falsity of some hypothesis.

How should you change the plot in order to produce a certain effect?¹

Established Practice in Questioning

The student who has given careful consideration to the foregoing list of thought questions will have only a part of the essential information for good questioning. He should understand also how to present questions to an individual or to a group and how to react to the answers. Until he has formed the essential habits related to asking questions and reacting to answers, the teacher should give thought to these established practices while planning his classroom activities.

1. *Voice and manner*. If the pupils are busily engaged in proper activity and if the teacher is wholly at ease and entirely absorbed in the pupils' work, the chances are that the voice and manner, as natural expressions of the teacher's personality, will adjust themselves to fit the occasion. The tones will be mild and low as the teacher stands beside a pupil and asks a question about a slight error he has made in his work. Deliberative thought will be reflected in the teacher's voice and stimulated in the minds of the pupils a moment later if he senses that the error might become common unless checked and decides to gain the group's reaction

¹ Walter S. Monroe and R. E. Carter, "The Use of Different Types of Thought Questions in Secondary Schools and Their Difficulty for Students," *Bureau of Educational Research Bulletin No. 14*. University of Illinois, 1923.

to the situation in which the error has occurred. In conducting a rapid drill, the tone qualities and the tempo will frequently be at the other extreme: crisp, sharp, rapid, challenging. Every occasion calls for a slightly different mode of speech in asking the question. Perhaps the best single rule is to keep the purpose of the question in mind and to vary one's voice accordingly. Thus questions intended to stimulate prompt attack at the beginning of an hour might be most effective if asked rapidly and in a sharp businesslike manner, whereas such a manner might later in the hour defeat the purpose of a question intended to foster calm deliberative thought on a rather complex problem.

2. *Stimulating pupils to ask questions.* It is rather strange that our schools have become so formalized that the teacher, who is presumed to know, asks questions of the pupil, who is there to learn. Originally the question was a device used by the uninformed in seeking information of the informed. This strangeness does not entirely disappear with the explanation that, beginning with Socrates, questions have been used by mature minds to lead less mature minds safely through labyrinths of thought. The natural purpose of the question remains of basic significance; the one seeking knowledge should have first claim upon the question. The formalized question-answer regime resulted in no small degree from the erroneous idea, now discarded, that education consisted of the amassing of factual information and that the pupil's education was directly proportional to his ability to recite answers to questions the teacher might ask. In the more progressive public schools the trend is distinctly toward the natural use of the question; pupils are stimulated to ask questions of each other, of the teacher, and of other persons.

Consequently the problem of encouraging pupils to ask questions should receive the teacher's consideration while planning and pursuing his classroom activities. Several points may be enumerated in this connection.

- a. The teacher should assume that the pupil's question arises from a real problem, even though at first it may appear irrelevant to the unit. Teachers unable to throw off the traditional suspicion that apparently irrelevant questions are attempts to spoof the teacher should use great caution not to reveal that suspicion through such typical reactions as sarcasm, ridicule, injured dignity, reprimand, or actual anger. It is better to be the victim of an occasional hoax than to run the risk of checking the flow of normal, wholesome questions of active, growing minds. The oversuspicious teacher in this situation is himself the offender and by his reactions actually challenges the pupil of spirit to ask inane questions, whereas the teacher who places confidence in his students will seldom have that confidence violated.

- b. The discussion above plainly suggests that the teacher should encourage pupils to ask questions. He may do this by courteous consideration of the questions, by setting aside special time for questions by pupils, by stimulating thought toward problematic situations, by directing social approval toward pupils who ask stimulating questions, and by other practices in accord with wholesome class management.
- c. In schools where pupils have not been permitted to ask questions freely the teacher may find it necessary to train pupils to ask good questions. In such cases a thorough discussion with the class on the purposes and characteristics of good questions will be in order. The pupils will soon see the sound sense of their asking questions in order to learn and to use what they learn instead of remaining passive until the teacher prods them with questions about things he already understands.
3. *Distribution and frequency of questions.* The teacher should give each pupil the opportunity to respond occasionally. It is preferable not to use a mechanized plan for this purpose, such as a roll book or a pack of cards carrying the names of pupils, but some care must be exerted to prevent the overanxious pupil from answering or asking all the questions. Questions should follow the sequence of the unit, so far as possible, and students should be trained toward this end and encouraged to withhold questions which belong to subsequent work.

The number of questions is governed by the work in hand. During the first and last stages of a unit more questions are asked by the teacher than during the middle stages, but the converse is true of questions asked by pupils. Within any given period, questions which require relatively more time for answering will necessarily be fewer in number than those designed for rapid drill or review.
4. *Variation to fit differing needs and purposes.* The difficulty of questions should vary according to the abilities of the pupils. Although the teacher as a rule will not designate the pupil until after the question has been asked, he should nevertheless have the pupil in mind and while wording the question be governed by that pupil's ability. Likewise the teacher should vary the type of question according to the object of the question, whether it be to catch a pupil's attention, to stimulate, to drill, to test, to review, or to provoke thought. While planning the instruction the beginning teacher should write out sample questions of appropriate types to guide him during class time. Later the art of varying questions to fit the need of the moment will become second nature.
5. *Mutual reactions of pupil and teacher to questions and answers.* Pupils and teacher should have at least a tacit understanding as to how each will ask and answer questions and as to the kind of response each is to give

to the other's questions and answers. In the first place, frankness and courtesy should prevail throughout. Each should be permitted to challenge the other's answer if he has reason to disagree. Each should expect full and complete answers to the questions he asks, and similarly each should require himself to frame the questions clearly. The teacher has no right to demand courtesies and satisfactions of pupils which he is unwilling to reciprocate.

The teacher should be guided by the temperament of the pupil in dealing with incorrect answers. In some cases an abrupt challenge will be most effective, and in others a milder method intended to lead the pupil toward the correct answer will be best. The alert, intellectually aggressive pupil may be treated as a colleague in learning, whereas the shy, self-conscious pupil must be freed of his timidity before comradeship in learning can become a reality.

The Function of Drill in Learning Exercises

Drill, as an essential in habit formation, has a definite function to perform in the learning process, because much learning consists of the formation of mental, physical, or emotional habits. The rules of punctuation, capitalization, simple mathematics, or correct speech should become so definitely fixed as mental habits that they will be applied automatically. Physical skills in writing, typing, laboratory work, and physical education must be developed, in each pupil concerned, to the degree of precision consistent with his ability and purpose. Habits of inhibition are basic to emotional control, and habitualized emotional reactions make possible the development of ideals, attitudes, and appreciations. These illustrations of automatized reactions make clear the point that the mental, physical, and emotional outcomes of school activities are in no small measure the results of habit formation. As such they are in varying degrees dependent upon drill.

Nothing could be further from the truth, therefore, than the erroneous conception that drill has no place in the modern school. Yet this concept prevails. Strangely enough, the concept exists more as an accusation made by those who enjoy criticizing the progressive public school than as a reality in the minds of those in charge of such schools. The critics have built up such an emotionalized response to the matter and have defined drill in such conventional terms that they are often unable to identify vitalized procedures of habit formation when they observe them. Many classroom practices are effective as drill which do not at all re-

semble the drudgery called drill in the highly formalized school where effectiveness is sometimes measured in proportion to the unpleasantness of the procedure. The beginning teacher's only concern with the controversy over drill is that he avoid entering it. He should realize that the results of drill are more important than the instruments of drill and that effective drill procedures must be given proper place in his instructional plans.

To aid the prospective teacher in formulating a sound attitude toward drill, a number of principles that have been established either by experimentation or by long and successful use are presented at this point. These principles should guide the teacher in planning his work as well as in executing the plans in the classroom.

There Should Be a Legitimate Purpose for the Drill

More than a generation ago Rice demonstrated that more time was being spent in spelling drills than could be justified by the outcome. There was no legitimate purpose for the drill beyond a given point. Beyond that point it was waste and drudgery. The purpose of the drill will usually be to automatize a specific response to a given level of proficiency or to eliminate erroneous or nonessential elements that inadvertently have been allowed to creep into the response. The teacher must have this purpose clearly in mind for each pupil. Aimless drill has no place in the school, and drill as punishment is unthinkable. Drill is legitimate only when used for wholesome development.

The Pupil Should Understand the Purpose of the Drill

The best results may be expected when the pupil, keenly aware of the need for the drill, enters it with willingness and enthusiasm. Time may thus be saved for both teacher and pupil in gaining the pupil's confidence and co-operation at the outset by helping him clearly to define the purpose of the drill.

The Desired Proficiency Should Be Defined

It is futile to expect the same kind of performance of all pupils. Consequently the degree of proficiency expected from drill should vary according to the ability of the individual pupil. A second factor which should determine the degree of proficiency is the purpose of the pupil. Thus, greater skill in typing may be expected of those training for secretarial positions than of others.

The Pupil Should Have a Clear Understanding of the Process by Which the Standard Is to Be Attained

Both oral and written instructions should be provided, and a careful demonstration of the process should be given. Questions should be interchanged between pupil and teacher frequently until the pupil clearly sees the entire process.

Drill Should Be Individualized

At various points in the foregoing discussion the word "pupil" has been used in the singular. Pupils vary so much in their need for drill and in the time required to attain the desired proficiency that, except for the beginning of a new process, drill becomes an individual matter. Violations of this principle have frequently forced the abler students to continue drills long after they had mastered the process. This practice is not only wasteful; it also frequently leads to irritation and discontent.

A Correct Start Is Important in Drill

After the pupil has gained an understanding of the purpose and the process and has defined his standard of achievement, he should begin the procedure without error. While common sense makes it clear that a false start doesn't result in irreparable damage, it is nevertheless advisable to exert considerable care to have the initial practices devoid of error. This implies that the elements in the process should be performed correctly and also in their proper sequence.

Attentive Repetition Should Follow at Properly Spaced Intervals

Mechanical repetition of the process, particularly when it is mental, without consideration of its meaning or significance is less effective than repetition with concentrated attention. For example, poetry is learned most effectively when understanding precedes and accompanies memorization.

The length of the practice should be regulated by the mental maturity of the pupil and by the nature of the content. The practice period should be ended when such symptoms as fatigue or restlessness bear evidence that the limit of effective learning has been reached for the given pupil. The average practice time should be approximately twenty minutes. Experiment has shown that it is more economical to space practice over several short daily periods, ranging from twenty to thirty minutes, than to use the same amount of time in longer periods during one day.

Practice Should Be Varied

This principle means that practice should be achieved in different ways to keep the work from becoming monotonous. A class in geography acquired a series of basic facts about Holland by use of pictures, slides, a sand table, a dramatized story, maps, oral spelling, questions and answers, and a group of objects constructed or collected by the pupils. Even in such skills as typing a varied approach may be used to keep the pupils interested and concentrated upon their work.

Accuracy Should Precede Speed

First thought should be given to accuracy. Careful, deliberate practice should eliminate errors before attempts are made to increase the rate.

The Learner Should Know of His Achievement

This principle applies not only to success but to errors as well. An awareness of error is the first step in its elimination. The error should be detected soon after its occurrence, to prevent its becoming fixed. Thus constant appraisal of work is necessary.

Actual experiment has shown that pupils achieve better when kept informed of their success. Such information acts as a powerful motivating force.

A Time Limit Is Sometimes Desirable

After a fair degree of accuracy has been attained, speed may be developed by setting a time limit. This applies to tests of information or to practice in the use of facts as well as to the development of mechanical skills.

Drill Should Be on Wholes Rather than on Parts

Considerable study has been given the problem of whole versus part learning, as, for example, in the memorization of poetry. The general conclusions have favored the whole method even when the number of lines learned (in poetry) exceeded two hundred. Pupils who studied the whole rather than part by part learned more quickly and retained better. This principle probably covers all memorizing done in secondary schools because the length of the material memorized in secondary school rarely if ever exceeds that used in the experiments. It should be stated, however, that this principle has not been established by experimentation for all types of processes.

Deviations in Procedures Should Be Permitted if the Results Justify Them

It should not be required that all elements in a process be performed in exactly the same manner by all pupils. The end result is of more importance than the means by which it is achieved. The best procedure for a given pupil is the one which will bring the best results to him. This principle should be applied with discretion, however; for example, although the "hunt and peck" system of typewriting, picked up by a pupil without training, might produce the best results before he has mastered the touch system, such an improvised plan should be discarded for one of proved efficiency.

The principles outlined above are not infallible and should not be followed slavishly. On the whole, however, they constitute a sound body of well-established practices of much value in planning and conducting drill.

Provision for Emotional Development

Consideration of exercises which will aid in the development of desirable emotional patterns is an important phase of planning. The direction of the child's emotional life is as essential a part of teaching as the development of his intellectual capacities. In recent years there has been a trend toward greater emphasis upon the emotional than upon the intellectual, because, it is held, the emotions or feelings play a more important role in life than the intellect. Also it is pointed out that the pupil will soon forget facts but will long be influenced by the ideals, attitudes, tastes, and other affective, emotional, or feeling phases of the experiences he has while learning.

The emotional patterns are of two general types. The first type includes those which have a social end in view. They foster respect for the customs and standards which society has set up for its own preservation. They cause gratification to accompany willing adherence to those ways of reacting, and uneasiness or embarrassment to accompany violations. These emotional determiners of action or inhibition are the ideals, attitudes, and characteristic reactions which unify any given society by causing the individual to follow the rules of the game. They perpetuate national and racial traditions, sex codes, altruism, ethical standards, character principles, and other aspects of human living together.

The second type of emotional pattern is primarily related to the individual's happiness. It includes the inner states which enable the individual to perceive and enjoy beauty and perfection in form, color,

sound, technique, thought, or deed. Individuals vary widely in sensitivity and consequently in their ability to profit from training for this type of emotional response, but all should be given the opportunity to develop whatever potentialities they have for the enjoyment of beauty and perfection.

When planning the instruction the teacher has two general problems relative to the development of wholesome emotional patterns: first, the selection of pupil experiences or subject matter which will stimulate emotional reaction; secondly, the planning of procedures to be used by himself while guiding the pupil's reaction in the experience or to the content. The first problem is one of curriculum, and the second is one of method. The two problems are interdependent. For example, the most dramatic experience may be meaningless if carried out in a humdrum fashion, while content of little emotional power may be electrified by proper approach and treatment. The present volume is largely concerned with method, but it may be said in passing that possibilities for building desirable emotional responses exist in every type of secondary-school experience; they are not limited to the fine arts and related fields. English, history, science, practical arts, language, and every other field of study and experience abound in opportunities to build social ideals and attitudes and to develop the ability to see and enjoy beauty of all types.

The procedures to be followed in the guidance of emotional development are less well defined and established than those pertaining to drill. Factors beyond the control of teacher or learner, such as sudden change in mental or physiological state, frequently nullify all known rules. Consequently the principles which have been found of value much of the time sometimes fail in specific cases, and accordingly should be used with discretion. The effectiveness of the teacher is greatly increased, however, by careful observance of the more widely accepted of these principles. The following are offered for the student's consideration. Long experience of many persons has shown them to be useful in developing both types of emotional patterns: those which lead to social unity and those which lead to personal happiness.

Adequate Preparation Should Precede the Stimulation of Emotional Response

Nowhere in teaching is the Herbartian principle of preparation more important than in the development of emotional response. The pupil must be attuned to the situation before the desired response can occur. Thus

ample time should be spent in leading up to the response. The atmosphere of the room and the decorations often play an important part in producing the proper mental set for any given response. The stage should be so well set that the pupil will project himself into the situation, after which the desired reaction will usually be the natural one.

The Materials Should Be within the Understanding of the Pupil

One may occasionally observe a teacher rapturously explaining something of beauty while the pupils listen indulgently but without feeling because the teacher is entirely outside their realm of experience. A contact with the pupil's understanding must be made if his feelings or emotions are to be aroused and directed.

No Attempt Should Be Made to Develop an Emotional Reaction to the Same Degree of Intensity in All Pupils

Pupils vary in perceptive and reactive powers of all types. Thus the innate basis of feeling and reaction varies. For example, there is evidence that some children intuitively sense discord in tones, while others sit by wholly unaware that anything is wrong. Some become ecstatic upon seeing a beautiful scene, while others view it as unperturbed as a mule. It would quite obviously be futile to expect all to react in the same manner to any given situation intended to develop emotional patterns. The goal should be the most desirable reaction of which the given pupil is capable.

Informality Is More Effective than Formal Procedures

Formality curbs the spontaneity which is often a vital factor in emotional development. Any rule of thumb tends to set up blocks in the path of the emotional response which frustrate its development. On the other hand, informality and freedom of expression encourage the exercise of any desirable emotional development. This suggestion, perhaps more than the others, should be applied with discretion. Certain courtesies are at all times to be observed; informality means ease of manner rather than unrestricted freedom.

By His Own Actions a Teacher Must Give True Evidence that He Possesses the Pattern Being Developed in His Pupils

This general principle is of significance because of the unconscious and conscious tendencies for pupils to imitate. A teacher of outstanding personal qualities and ideals often is a profound influence upon the emo-

tional development of pupils simply by being what he is. Such an individual also has greater success than others of less desirable traits when consciously stimulating a proper ideal or taste, not only because his own actions continually illustrate the trait but also because his pupils realize he is expecting no more of them than he requires of himself.

Analytic Treatment, as a General Rule, Should Be Deferred until the Pupil Acquires Sufficient Interest to Request It

This suggestion is somewhat conjectural and is meant to offset the all-too-frequent tendency to dissect works of art or literature as they are presented to pupils. Only slight analysis is necessary to give the pupil proper understanding for his initial experience. As his interest grows, questions will arise which will lead him to further study and to voluntary analysis. If he needs aid, he will direct questions to the teacher.

The Emotional Pattern Should Be Permitted to Develop Gradually

Attempts to force upon children fully developed patterns of emotional reaction by use of precept, dogma, ritual, or highly dramatic experiences in schools may be questioned. Reactions permitted to spring from normal child experience and to grow at their own rates are likely to be more sincere and more lasting than those imposed by authority. An understanding of the meaning of the given situation is the more solid basis upon which to build emotional reactions to it. As the understanding increases, the response will gradually become a more definitely fixed part of the individual's emotional life.

Frequent Opportunity Should Be Given for the Use of the Response

Emotional responses, as a general rule, resemble mental and motor habits in requiring numerous repetitions before becoming definitely and permanently fixed. Formerly it was thought that character, for example, could be developed through precept and example alone; now the law of exercise is applied by providing numerous situations in which the pupil may practice desirable character traits and thereby build up the emotional foundations for them. This is true of all other types of emotional patterns. Aesthetic sensibilities are developed by numerous contacts with examples of beauty in color, tone, or form. Attitudes and ideals intended to unify the social group are best developed by contacts with associates, in which the desired emotional reactions are given ample opportunity for exercise.

This final principle of use guarantees that the desirable emotional reactions, carefully fostered and developed in accordance with the foregoing suggestions, will eventually become powerful forces for social unity and personal happiness.

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CHAPTER XII · Visual Aids in Learning Exercises

GENERAL VIEW OF THE CHAPTER

Purpose of the Chapter

Relation of Visual Aids to the Unit Plan

Visual Learning neither New nor a Fad

Functions of Visual Education

Research in Visual Education

Experience in Visual Education

Types of Visual Aids and Illustrative Learning Exercises

Sources of Visual Materials

Selected References for Further Study

Purpose of the Chapter

THE two preceding chapters have discussed somewhat at length the problem of planning and starting the attack upon learning exercises. Many learning exercises in the well-managed school employ materials which may be examined by the learner. Such materials are intended to clarify and intensify the learner's mental images of the object, process, or event being studied. These materials are called visual aids to learning, and the procedure involved in using them effectively is called visual education. The field of visual education is an important and rapidly developing aspect of teaching. The planning of learning exercises which will result in advantageous use of visual aids requires of the teacher much specific knowledge and many definite skills.

Earlier chapters have merely mentioned the use of visual aids in learning activities. It is consequently the purpose of this chapter to introduce the student to the broad field of visual education and to make it possible for him to acquire a bare minimum of knowledge and skills essential to the successful direction of learning exercises which use visual aids.

Relation of Visual Aids to the Unit Plan

Visual instruction should not be considered a distinct mode of instruction comparable with the unit plan. In fact, it may be considered an aspect of this or of any other general method of learning, to be called into

play whenever visual materials will facilitate learning. Its close relation to the unit plan developed in Chapter IX is made clear at this point.

The four stages of the unit plan there set forth are Introduction and Attack, Study and Work, Integration and Application, and Appraisal of Outcome. Several illustrations will indicate the relation of visual aids to each stage. A quick introduction and a vigorous attack may result from attractive textbook pictures, from a bulletin board of pictures obtained from magazines, newspapers, or the teacher's files, from five or six well-selected slides shown upon the wall or upon a screen at the outset of a unit, from a few graphs which present challenging facts, or from a short reel related to the topic.

The study-and-work stage progresses more successfully when pupils have access to pictorial, graphic, or objective material related to the problem. One teacher of integrated mathematics takes his class to a bridge to study applications of the triangle; a teacher of social studies has his class collect cartoons on the New Deal and regularly compile a set of pictures from newspapers on each problem studied; a teacher of general science uses a series of eight reels of sound motion pictures to accompany his seven main units of study during the year; and all alert teachers make frequent use of blackboards, charts, maps, and models whenever need for them arises in the study of the unit.

During the integration-and-application stage frequently the pupil is encouraged to summarize his work in graphic or booklet form. Thus a class in sociology prepares a graph showing the number of persons of each nationality in the community; almost every biology class has an aquarium and collections of moths, woods, and rocks, many of which are prepared by pupils as they become interested in various problems; many classes prepare charts, models, or maps of various types which bear witness of progress in history, geography, or other fields of interest. Such activities should be used to supplement the other experiences of the integration-and-application stage whenever possible.

Visual aids may be of value also in the appraisal-of-outcome stage of a unit. Thus the blackboard may be used in summarizing the outcomes, and the finished products of various projects may themselves be evidences of the inner growth of pupils. Likewise teachers may make use of visual aids in testing. For example, one general-science instructor tested the pupil's understanding of the relationship of the earth, moon, and sun by a diagram showing the orbits of the earth and moon, the direction of the sun's rays, and the observer's location. The pupil was instructed to

locate the new moon, the full moon, the positions of the several bodies at the lunar and solar eclipses, and to designate other relationships. Similarly a teacher of biology or any other subject may use as a test a diagram of any object of study, with instructions to name the parts. Maps may be used in like manner to test the pupil's knowledge of place geography.

It should be quite clear from these few illustrations that visual instruction should be used at all stages of the study of any unit to clarify, to intensify, and to vivify the mental images which the pupil forms as he learns. The clear-cut images which result from seeing the objects give meaning to the words which name the objects. When the images involve processes and relationships rather than just objects, a clearer understanding is promoted by having the impressions from the ear intensified by those from the eye. The truth of these statements will become more evident as the chapter continues.

Visual Learning neither New nor a Fad

The impression that visual learning is something new in education is entirely erroneous. It is not new. The chances are rather great that it is the oldest form of learning and that it antedates the era of articulate language. Long before the time of the alphabet crude drawings certainly were made in sand and elsewhere to aid in learning. The Greeks used objects in their instruction and emphasized the value of the school journey, the forerunner of the field trip. The plan of including pictures in textbooks was originated three centuries ago.¹

Such an ancient form of learning cannot reasonably be considered a fad, although uninformed persons, especially those who magnify the significance of memorization and other verbal learning, are sometimes inclined to refer to visual instruction as an innovation which will soon be discarded. The facts are quite to the contrary. Progressive teachers everywhere are increasing their use of visual aids. For example, McClusky² reported that fourteen of the largest cities in the United States had increased their expenditures for visual instruction from \$370,000 in 1922-1923 to \$830,000 in 1931. The recent growth in visual education is described by Dorris³ as follows :

¹ The first textbook which carried illustrations was *Orbis Pictus*, by Comenius, the Moravian educator who lived from 1592 to 1670.

² F. Dean McClusky, *Visual Instruction: Its Value and Its Needs*, p. 63. Mancall Publishing Corporation, 1932.

³ Anna Verona Dorris, *Visual Instruction in the Public Schools*, p. 4. Ginn and Company, 1928.

This is one of the most widely discussed subjects in the field of education today, not only in America, where hundreds of schools are being equipped with up-to-date apparatus for the more efficient use of visual materials, but also in nearly every enlightened country of the world, including England, Sweden, Denmark, France, Germany, and Japan.

McClusky¹ states that in September, 1931, there were twenty-eight officials in charge of state visual-education service in twenty-five states and Hawaii, and two hundred and twenty-five officials in charge of city, district, and county departments of visual education, representing two hundred and five cities and communities in thirty-three states. The number of higher educational institutions which offered teacher-education courses in visual education increased from seventeen in 1922 to three hundred and fifty in 1935.

The following statement, courteously submitted to the writer in February, 1936, by an authority in visual education,² is of much interest.

The significance of visual education is further emphasized by the recent developments in more than forty nations. The League of Nations has sponsored the International Institute of Educational Cinematography, with headquarters in Rome, Italy. This organization is mainly supported by the Italian government. It acts as the parent organization and corresponding agency for educational film groups in a number of countries throughout the world. *Intercine* (formerly the International Review of Educational Cinematography) is published monthly in English, French, Italian and German.

In France several groups, working through a Central Film Library set up by the Bureaux of the Educational Cinema, serve the schools, the non-theatrical field, the soldiers' barracks, workmen's leisure-time groups and other vocational and cultural study groups.

In Russia all motion picture production and distribution is under one soviet agency or State Motion Picture Institute, which has a highly trained group of film technicians who must graduate from a four years' course before practicing their craft.

Germany has a recently organized National Institute for Instructional Films, operating under a direct tax levy upon school children. It is setting up a "plan of requirements" which producers will follow in producing films. The *Deutsche Filmzeitung* is the magazine which carries information on this work for the schools.

The British Film Institute, 4 Great Russell St. W. C. 1, London, has been in operation for two years. It has more than 75 subject matter committees

¹ Op. cit. p. 39.

² Cline M. Koon, senior specialist in radio and visual education, Office of Education, Department of the Interior, Washington, D.C.

working in various fields, ascertaining what films are needed, evaluating existing films and furnishing collaboration to producers of new subjects. *Sight and Sound* is the quarterly official publication of the British Film Institute and contains many articles of interest to the teacher.

In the United States the National Education Association has a Department of Visual Instruction, which resulted in a fusion of two groups formerly working in the field. *The Educational Screen*, published at 64 E. Lake Street, Chicago, is the only magazine devoted entirely to the instructional film. This is a private enterprise, although it carries news of the Department of Visual Instruction and has some of its members upon its staff.

The United States Office of Education, in the Department of the Interior, has had a Specialist in Radio and Visual Instruction since 1932, and has furnished help and information to schools and colleges throughout the country.

More recently the American Council on Education, of Washington, D.C., an association of educational institutions and associations, has undertaken the establishment of a national educational film institute to act as a national, non-profit clearing house and extend the production, distribution and use of films for educational purposes.

Increased impetus is expected in this field of activity from such strong commercial groups as Eastman Teaching Films, Erpi Pictures Consultants, Inc., and a number of large manufacturers of motion picture equipment, as well as the major and minor producer of films.

Functions of Visual Education

Various functions or values of visual instruction were implied in the discussion of the relation of visual aids to the unit plan. They will now be given a more complete treatment.

To Give Correct Initial Concepts

One of the chief functions of visual instruction is to give the learner true mental impressions, or concepts, at the time he first learns of an object or process. Correct initial concepts prevent subsequent errors and obviate the need for diagnostic and remedial teaching. A teacher cannot be certain that his verbal description will convey the correct impression, especially if he finds it difficult to compare the object being described with something with which the pupil is already familiar. The difficulty is removed immediately if a picture is available. It is essential, however, that the size of the object be indicated or that something known to the learner appear in the picture with the unknown object, as, for example, a man or a dog beside the elephant in the first picture of that animal seen by a child. The concepts will be the more clearly acquired if additional

characteristics are given in the picture, such as color, sample habitat, typical food, or other suggestion of life habits of a previously unknown animal.

The conveyance of correct initial concepts is achieved through various other types of visual aids, such as real objects in the classroom ; trips to observe processes, sites, or objects ; graphs of records or trends ; models, diagrams, or maps ; and motion pictures.

To Broaden the Sensory Experiences of the Learner

The mind of a child would remain blank if it received no impressions through the sense organs. It is dependent upon the sense organs for its development. It therefore follows that a function of visual instruction is to increase the number of impressions received through sight. The more clear-cut and true visual images a learner acquires about anything, other things being equal, the better will he understand it. For example, in any field of natural science a pupil must become able to visualize a large number of specimens. The wider his sensory experience in this respect the better his grasp of the field, other aspects of learning remaining constant.

To Intensify Impressions

Visual aids facilitate learning, and very likely aid retention, because they *intensify* the impressions. Any visual means of transmitting impressions of form, size, color, motion, or other characteristic of the subject of study has a strong appeal and causes the imagery to become firmly embedded in the mind.

To Vitalize Instruction

To see real objects or pictures of them is more lifelike than to read about them or to hear someone describe them. Visual aids, whether used in the classroom or visited outside, thus add life to the learning process by making the experiences real rather than verbal. This function of vitalizing instruction is in itself sufficient justification for the expense and effort involved in visual instruction.

To Give Vicarious Experience in Activities outside the Pupil's Environment

A series of slides or a reel presenting the customs of a person the same age in other lands or of earlier times enables the learner *to be* that person and to have his experiences. Admiral Byrd's pictures have carried thousands to the Antarctic, while other authentic motion pictures have en-

abled pupils to make world-wide trips which are almost real to them. In fulfilling this function visual aids may be laying a good basis for a sane internationalism merely by promoting mutual understanding and respect.

To Give Experiences with Concrete Things

Several of the functions previously discussed imply that visual aids give experiences with concrete things. Giving such experiences is in itself an important function inasmuch as it combats the typical classroom tendency to become too abstract. Unless words convey definite meanings, they do not stimulate correct thinking. Such visual aids as real objects or models give definite meaning to many words and thereby combat verbalism, or the use of words without attention to thought.

To Motivate

In a given situation a teacher's primary purpose in using visual aids may be to arouse interest in activities about to be suggested. A few well-selected pictures for the bulletin board will arouse curiosity in a subsequent unit even before the work on another has been completed. An illustrated lecture may often serve to introduce a new unit and to stimulate thinking in the problem. A sound reel motivates still better in materials in which motion plays an important part.

The first step in arousing interest is to attract the attention of the pupil. Visual aids achieve this step in a rapid and effective manner. They are likewise of value in building and sustaining a lively interest as the unit progresses.

To Supplement Other Learning

Every well-prepared text for the secondary school carries carefully selected pictures or graphic materials to supplement the written account. A skillful teacher often makes rough sketches on the blackboard to clarify or elaborate the discussion. An English class which has read *David Copperfield* is invited to see the film. A discussion of irrigation is supplemented by a series of slides. The visual aids not only add to the other learning; they clarify, enrich, and help to organize it as well.

To Vary Classroom Activity

Enough has been said to indicate that visual instruction does vary classroom activity. The teacher may sometimes have this as a chief purpose, although it is usually incidental to such purposes as motivation, vitalization, enrichment, or clarification.

To Save Time

To show a picture of an object is frequently the quickest way to give an understanding of it. Furthermore, seeing an object or process results in clear-cut mental images which reduce the need for subsequent remedial instruction. Time may be saved also in launching a problem with visual materials, because the attention of the pupil is attracted without delay. After a problem has been studied, the review is facilitated by the use of graphic and pictorial aids. Inasmuch as our curriculums are crowded with activities intended to enable the child to keep pace with our rapidly moving society, time-saving is not the least important function of visual education.

Research in Visual Education

The idea of measuring the results of given procedures in a manner comparable with that used in the physical sciences has quite definitely entered the field of education. Practices which are based solely upon opinion and uncritical experience are being challenged by educators and research workers. The experimenters have made definite progress in testing the results of visual aids, and in the process they have made discoveries of value to teachers at all levels of the public-school system.

It is the purpose of this section to present some of the more significant of these findings, with brief suggestions for their application to classroom use. The scientific techniques used in these studies are of interest in themselves, especially to the student who is planning graduate work, and may be found discussed in detail in the original reports of the studies.¹ The purpose of the present discussion is to consider the results only.

Freeman and his colleagues² obtained practical results which are highly suggestive for classroom work. In the first place, they found that the motion picture is superior to slides, stereographs, and still pictures in cases "in which the understanding of the action of an object requires that it be shown in motion." [Page 74.] For example, children understood steamboats better from the films than from the other aids. Thus the nature of the content to be studied is a factor in determining the rela-

¹ See the bibliography at the end of this chapter.

² Frank N. Freeman (editor), *Visual Education*. The University of Chicago Press, 1924. (A report of an investigation made, with the aid of a grant from the Commonwealth Fund, by Frank N. Freeman, F. Dean McClusky, H. W. James, E. H. Reeder, Andrew P. Hollis, Caroline Hofer, Edna Keith, H. Y. McClusky, E. C. Rolfe, Lena A. Shaw, D. E. Walker, Nina J. Beglinger, and Jean A. Thomas.) Reprinted by permission of The University of Chicago Press.

tive value of the film and the nonmotion types of aids. Where it is important that the pupil grasp the nature of the movement, films are found to be superior.

On the other hand, the still picture "permits analysis" and "provides the opportunity for a more active study attitude on the part of the pupil." [Page 74.] This would obviously be true with graphic or tabular material but likewise applies to objects which can be understood without reference to motion.

The experiments by Hollis and by Rolfe in this series showed that in teaching science a good demonstration by the teacher is superior to the motion picture. Similarly, in teaching a class to do or to make something the demonstration is the superior method. These definite findings emphasize the significance of the demonstration in certain classroom situations and should make teachers confident of its value as a visual aid to learning.

The use of stereographs and slides in teaching oral English to foreigners was demonstrated by Beglinger¹ to be highly effective. In her experiment pupils who used pictures with brief themes printed on the back gained markedly more in the ability to construct correct oral sentences than the pupils who did not use the pictures. A similar visual procedure might be used in any foreign-language class to supplement other methods of study.

The motion picture was found to be as effective as other advanced methods of arousing interest in health and of stimulating health activities, but not more effective than the other methods.² Consequently the experimenters advised against expenditures for rental of "such films as are available at the present time [1923]."

A general conclusion was that "the peculiar value of the film lies in its ability to furnish a peculiar type of content of experience rather than its generally stimulating effect." [Page 76.] Thus a film shown as the introduction to a unit proved of greater value than an oral introduction in Hollis's study,³ presumably because of the background it gave for the subsequent lesson. The same study demonstrated that the film is more effective as an introductory procedure than it is as a summarizing procedure. Similar findings resulted from Weber's⁴ studies. These results should give general guidance to classroom teachers in planning instructional activities.

¹ Frank N. Freeman (editor), op. cit. pp. 342-346.

² Ibid. pp. 346-376, by Caroline Hoefer and Edna Keith.

³ Ibid. pp. 275-282.

⁴ Joseph J. Weber, *Visual Aids in Education*. Valparaiso University, 1930.

In general, "motion pictures should be so designated as to furnish to the teacher otherwise inaccessible raw material of instruction." [Page 79.] Preparation for observing the film is necessary, as is discussion after the showing, if best results are to be obtained. The tendencies to consider the film sheer entertainment and to accept lazily everything seen without reacting must be eliminated if the film is to be of greatest effectiveness.

The superiority of the film over regular class instruction in history was demonstrated by Knowlton and Tilton¹ in a series of experiments at Yale. The films enriched the course of study, resulted in more learning, produced more pupil participation, and increased the amount of outside reading. Comparable results were achieved by Rulon² with sound films at Harvard in the field of general science. Rulon concludes his findings as follows:

The first [conclusion] concerns the children's attainment in terms of the subject matter generally: that presented by the text, class discussion, film, or teacher. In this large region the pupil-achievement increase ascribable to the use of the film may be expected to exceed 20 per cent.

The second conclusion concerns a smaller region: those facts and relationships specifically dealt with in the film used. Measured in acquisition and understanding of this material, the film-caused increase in pupil achievement may be expected to exceed 35 per cent.

The third conclusion is that neither of the above two gains may be expected to be made at the expense of more important but less definable values, such as good habits of thinking.

Such studies as these place the film upon solid ground as an aid to learning. It is no longer in its experimental stages.

A more recent series of investigations³ of the influence of motion pictures upon children corroborates the findings just discussed in showing that the motion picture causes an increase in factual learning. This series of studies goes farther and investigates the influence of commercial motion pictures upon the attitudes, emotions, sleep, and conduct of children. Most of the findings, therefore, have an indirect rather than a direct bearing upon classroom procedures. They contribute more to the teacher's understanding of the effect of the out-of-school environment

¹ Daniel C. Knowlton and J. Warren Tilton, *Motion Pictures in History Teaching*. Yale University Press, 1929.

² Philip J. Rulon, *The Sound Motion Picture in Science Teaching*, p. 106. Harvard University Press, 1933.

³ A series of twelve studies of the influence of motion pictures upon youth, subsidized by the Payne Fund and summarized in W. W. Charters, *Motion Pictures and Youth*. The Macmillan Company, 1935. The following quotations in this section are from this publication, by permission of The Macmillan Company, publishers.

upon the pupil than to the teacher's knowledge of classroom aids to learning, although most of the following quotations also carry useful hints for the classroom. The main findings of these investigations follow.

1. Comparing children with adults in recognition of the different features of a motion picture, Charters found these percentages :

Thus using the adult score as a basis, children of 8 and 9 years made 60 per cent, those of 11 and 12 made 75 per cent, and children of 15 and 16 made 91 per cent of the score obtained by adults. . . . If the parents take their 8 year old child to the movies he will catch three out of every five items that the parents catch. [Page 8.]

2. With respect to the retention of facts learned Charters makes this significant conclusion :

In general the second-third-grade children at the end of six weeks remember 90 per cent of what they knew on the day following the show. Three months after seeing the picture they remember as much as they did six weeks after seeing it. In some cases, as with "Tom Sawyer," they remember more at the end of six weeks and still more at the end of three months. At all ages including the adults the slow drop of the curve of forgetting is striking . . . "motion pictures appear to make a greater contribution to visual education than was previously suspected." [Page 9.]

3. One of the intriguing problems of the teacher is that of sex differences. The Payne studies revealed the following point with respect to the learning of boys and girls from motion pictures they attended :

Finally no significant sex differences appeared in the amount of information acquired or the amount remembered at later dates. Girls and boys remember about equally well. [Page 17.]

4. The marked influence of the motion picture upon children's attitudes was disclosed in the study by Peterson and Thurstone :

The outstanding contribution of the study [Peterson and Thurstone] is the establishment of the fact that the attitude of children toward a social value can be measurably changed by one exposure to a [motion] picture. [Page 20.]

5. The study of the effect of motion pictures upon the emotions is summarized in very positive terms :

Blumer concludes that the samplings of instances of fright, sorrow, love, and excitement provided in his report "suffice to establish the point that motion pictures may play very vividly upon a given emotion of the individual; his impulses may be so aroused and his imagery so fixed that for a period of time he is transported out of his normal conduct and is completely subjugated by his impulses." [Page 30.]

6. Of less direct bearing upon the school is the conclusion relative to the effect of motion pictures upon sleep :

"We can conclude, however, from our results that seeing *some* films does induce a disturbance of relaxed, recuperative sleep in children to a degree which, if indulged in with sufficient frequency, can be regarded as detrimental to health and growth. We do not believe that any sweeping generalizations can be made about the 'type' of film or 'type' of child most likely to be influenced." [Page 35.]

7. Finally, the Payne Fund studies leave no doubt that the motion pictures have a decided influence upon the conduct of children :

In summary of the direct influence of motion pictures on conduct : they owe their power over children chiefly to the factor of emotional possession ; the range of influence of commercial movies is very wide ; the motion picture because of its potency in many directions plays a substantial and significant role in the informal guidance of children ; and the influence of pictures can be controlled in considerable measure by the development of emotional detachment and the application of an adult discount. In producing this intelligent attitude toward the movies, instruction in motion-picture criticism and appreciation provides a promising lead. [Page 43.]

The immediate effect of the Payne Fund Studies is described by Charles F. Hoban, Jr., director of the Committee on Motion Pictures in Education of the American Council on Education, in a volume summarizing five years of work on the Motion Picture Project under his directorship :

The Payne Fund Studies startled the nation. Powerful civic and religious groups were electrified into action against motion pictures that glorified evil and interpreted life as a whirl of parties and spangles in crimson and gold. Religious and civic groups answered the challenge of the movies with such organizations as the Legion of Decency, aimed at the box office — Hollywood's heel of Achilles. The motion picture industry, fearful and chastened, quickly organized a counter-reformation. The Motion Picture [Producers and Distributors of America, popularly known as the Hays office, put teeth into a new moral code for the movies, and a system of self-regulation was developed and imposed by the industry itself.

But the Payne Fund Studies did more than stir up a popular revolt against what was bad in the movies and inaugurate a clean-up campaign within the motion picture industry. They established the fact that motion pictures are effective in developing ideas, attitudes, and emotions. In other words, they demonstrated that motion pictures are a powerful medium of education — not just that kind of education cramped in a strait jacket of encyclopedic fact-getting, but education that deals with ideas and action, people and purpose.¹

¹ Charles F. Hoban, Jr., *Focus on Learning*, pp. 3-4. Committee on Motion Pictures in Education, American Council on Education, 1942.

Upon the foundation of such decisive evidence of potency as that provided by the Payne Fund and other studies, Hoban and his associates attacked the problems of how to use the motion picture in the school to obtain the best results and how to secure desirable films "at the right time for the right place in the curriculum." First a catalogue of films was prepared.¹ It was immediately apparent, however, that the problem of how to use the films was more fundamental than that of where to obtain films. To assist in the solution of the basic problem of use, the committee gained the co-operation of numerous school systems of various types and sizes throughout the United States and established four centers, in each of which was made a two-year study of motion pictures in the curriculum.

The Tower Hill Center used films in the classroom and auditorium for all elementary and secondary years as one means for attaining the school's aims of critical thinking, co-operation, appreciation, mental and physical health, and fundamental skills.² In summarizing its experience, the staff concludes that the motion picture makes definite and unique contributions toward such ends of education.³ The extensive use of motion pictures over the two-year period in the Santa Barbara Center yielded ample proof to support such claims for motion pictures as the following: "stimulate interest and activity" on specific units of work, "help to maintain and improve general interest in school work," provide "a good source of information," afford "an effective means of comparing and contrasting data," assist appreciably "in the raising of questions for future study," and "stimulate further activities and creative work."⁴

Among the many other values derived for general use from the experiences of the several hundred teachers in the Santa Barbara Center are the following principles of usage:

1. There must be a definite curriculum purpose for using a motion picture.
2. The motion picture must be an integral part of the classroom work.
3. After the motion picture has been shown, there should be time for child reaction to the picture, and these reactions should constitute a check on learning.
4. The teacher is to guide the work in the developing of the recognized purpose.

¹ American Council on Education, *The Motion Picture in Education*, Series II, Study No. 1. American Council on Education, 1937. 24 pages.

² The Staff of the Tower Hill School, Wilmington, Delaware, *A School Uses Motion Pictures*, p. 11. American Council on Education, 1940. viii + 118 pages.

³ *Ibid.* pp. 96-104.

⁴ Reginald Bell, Leo F. Cain, Lillian A. Lamoreaux, and Others, *Motion Pictures in a Modern Curriculum* (Motion Pictures in Education, Series II, Study No. 6). American Council on Education, 1941. ix + 179 pages.

5. A general procedure may be used to ease the class into a discussion situation which will encourage free and spontaneous reactions. This may result in several types of behavior, such as discussion, construction, and creative activities using dance, music, art, or oral expression.

6. An opportunity should be given for the raising of new problems, the altering of old ones, or the setting of new purposes.

7. Provision should be made for the satisfaction of these new problems of purposes.¹

From the foregoing findings it is clear that some aspects of visual education have stood the test of the critical research worker in education. Their values have been substantiated by experiment. Even so, there is much research still needed in this important field of education. Several areas for additional research in visual education are suggested by Kinder :

There is a crying need for researches into unit studies and grade level adaptations, application of audio-visual aids in certain areas of instruction and subject matter which are now relatively untouched, evaluations in the realms of attitudes, artistic and aesthetic judgments, objectives, appreciations, learning processes, and a host of others. By comparison with the researches in such fields as achievement tests, extracurricular activities, individual differences, guidance, or public relations, audio-visual education is still near the bottom of the ladder.²

Some of the foregoing findings of the several series of investigations in visual education support increased use of visual aids in the school. Others point to the need for guidance of pupils in the selection of films to see. Both types of findings are of practical value to the teacher. The one suggests to him improved techniques of teaching; the other gives him insights of value in extending his influence beyond the school.

Experience in Visual Education

Experimental research provides the best foundation for classroom practice in visual instruction and in all other teaching procedures. Until all practices have been validated by research, however, teachers will continue to draw some of their procedures from experience. In the field of visual education it is possible to supplement the findings of research with practices which have become established through successful use.

¹ Ibid. pp. 170-171.

² Quoted from J. S. Kinder, "Research in Audio-visual Education," *Educational Screen*, Vol. 18, p. 134, April, 1940, in Harry C. McKown and Alvin B. Roberts's *Audio-Visual Aids to Instruction*, p. 357. McGraw-Hill Book Company, Inc., 1940.

Visual education is not a distinct method; it is an aid to other methods. The most ardent user of visual aids would recommend them only as supplementary materials to increase the value of the pupil's school experience. They cannot replace learning activities of other desirable types, nor can they take the teacher's place as a guide to the pupil as he develops. On the other hand, there are few classroom procedures which cannot be improved by some type of visual aid.

Visual aids should meet needs which arise from other learning activities. The aids are most valuable when they answer questions which have arisen in class discussion. For example, bar graphs showing the proportion of each nationality among immigrants at different periods would be particularly enlightening to a social-problems class which had been discussing trends in immigration into the United States. In such a case the mental set of the pupils would be such that attention would be instantaneous and learning rapid.

This point does not imply that visual aids are not valuable at other times. In fact, they may frequently be used to stimulate interest in a new unit; yet they are considered more valuable when they satisfy existing curiosity.

Visual aids do not decrease the necessity for careful planning of instructional activities. In the first place, careful planning is involved in selecting visual aids. Not only must the teacher spend time in selecting and rejecting the aids, but he must also have advance knowledge of what the classroom activities are to be. Such knowledge can come only from planning.

It also requires planning to know how and when to present the visual aids. Their use should not be left to hit-and-miss methods which call them into action on the spur of the moment. Even though they might fit the occasion exactly, the pupil's time would be wasted while the teacher was assembling and preparing the materials for presentation.

Skillful planning is required also in preparing the pupils for the presentation. The teacher should anticipate the relationship between the pupil's work and the available visual material. This forethought makes it possible for him to direct the discussion up to the point at which the aids will be most effective.

Finally, the presentation should be followed by a discussion which also requires planning by the teacher.

Consideration of these several points suggests that effective use of visual aids requires more planning than other procedures, rather than less.

A few illustrations of direct bearing upon the problem are more valuable than a large number that are less apt. The teacher should avoid the tendency to use, just because they are available, those visual aids which, though perhaps entertaining, are only vaguely related to the problem. Such materials detract rather than aid.

No one type of visual aid is best for all occasions; consequently a variety of types should be used, each at the point of its greatest effectiveness. Experience and experiment alike have shown motion pictures to be highly effective when an understanding of a movement or of a process is essential to the student's learning. Also, the teacher may be certain that a graph or a still picture is better for purposes of analysis. A stereopticon slide is valuable for a discussion procedure, whereas a stereograph is preferable for individual study.

Care should be used to check visual aids for accuracy and reliability. If a teacher has any reason to doubt the accuracy of any visual material, he should check it carefully before presenting it to the class. It is difficult to remove incorrect impressions received from visual materials, because of the vividness of the impression.

Visual aids are ineffective unless they can be made immediately available whenever needed. In any school system, large or small, the materials for visual instruction should be administered efficiently. Numerous details are involved in storage, in prompt delivery to and from classrooms, in quick selection for given needs, in keeping the equipment up to date and in good repair, and in other aspects of administration. In this matter, as in all school activities, good instruction is dependent upon good administration.

In addition to the foregoing conclusions certain opinions relative to the value of visual aids are of significance. McClusky¹ reports a survey of the opinion of several hundred teachers who had had experience with motion pictures in teaching. An overwhelming majority stated that motion pictures are "helpful" or "very helpful" in one or more of the following ways:

- A. An increased interest in school work and a sustained interest in the topics studied.
- B. A quickened originality and a larger participation in project work and other self-activities.
- C. A greater desire and ability to discuss subjects.
- D. An increase in the quantity and an improvement in the quality of the material which they read.
- E. A clearer appreciation of the richness, accuracy, and meaningfulness of personal experiences.
- F. A greater facility in correlating features of their lessons with community conditions.
- G. A contribution to life experiences difficult and often impossible to secure by any other method.

¹ Op. cit. p. 31.

H. A marked improvement in range and accuracy of vocabulary.

I. An ability to concentrate mental activities, to think more accurately, and to reason more soundly.

It is true that some of these advantages may be open to question, particularly the last stated, until experimental evidence is available for their proof. Yet it is likewise true that several of the advantages, particularly A, C, D, and G, already have experimental evidence as well as opinion for their support, not only for motion pictures but for other types of aids as well. Consequently the teacher may feel on solid ground when using visual aids in the manner outlined in this discussion.

Another writer¹ summarizes the main values of fifteen types of visual aids, from the standpoint of experience, as follows :

1. *Motion picture*. Situations depending upon understanding of motion or emotion.
2. *Lantern slide*. Focuses attention of entire group for class discussion and analysis of a still picture.
3. *Film-roll*. An orderly and complete series of pictures showing every stage of a process, industry, or journey at a low cost.
4. *Opaque projector*. Projects textbook and magazine pictures, prints, maps, graphs, diagrams, or descriptive paragraphs.
5. *Stereograph and stereoscope*. Give reality to distance and depth, and shut child away from present environment.
6. *Textbook picture or print*. Recalls actual past experience.
7. *Maps and globes*. Give bird's eye view of large area and give sense of direction and location.
8. *Graphs and charts*. Help to visualize numerical relationships.
9. *Diagrams*. Cross-sections or complete views of inaccessible areas or complete processes at one time are best shown by diagrams.
10. *Dramatization*. Provides for emotional expression and an understanding of feelings or moods.
11. *Experiments*. Permit one to observe change when one has put materials under certain conditions to see what will happen.
12. *Museums*. Provide specimens, objects, models, and collections.
13. *Original sketches, posters, or a frieze*. A means of expression and an outlet for the child's imagination.
14. *Cartoons*. To convey a story of a political, social, or economic nature in briefest possible time and smallest possible space.
15. *Excursion or field trip*. Provide the actual first-hand experience.

¹ Elda L. Merton, Proceedings of the Seventy-first Annual Meeting (Chicago, 1933), Vol. 71, pp. 783-784. National Education Association.

Types of Visual Aids and Illustrative Learning Exercises

Various types of visual aids have been mentioned in the foregoing discussion. It is the purpose of the present section to describe in some detail the main types of visual aids and to illustrate their uses.

Textbook Illustrations

The authors who have prepared the better textbooks for secondary schools have exerted much care in selecting appropriate illustrations. The teacher should exert as much care in using them. Pupils should be taught to use them to supplement the discussion of the text. Often they can be made the basis of a socialized period. In schoolrooms equipped with opaque projectors the pictures, maps, and charts from texts may frequently be projected upon a screen for analysis and discussion.

To glance at the textbook illustrations presented with the treatment of a problem and to comment on them briefly is a desirable technique for a portion of the introductory stage of a unit. The teacher should realize that the author has assisted him in collecting a portion of his visual aids and should gain full advantage from them.

Blackboard

Few visual aids are of greater value than the blackboard from the standpoint of constant usefulness. The purposes for which it may be used are summarized in the Pennsylvania monograph¹ on the subject as follows:

1. For diagrams, sketches, drawings, decorative work.
2. As a screen for still projection — map outlines, picture and symbol, fade-outs.
3. For outlines, summaries, directions.
4. As a substitute for the bulletin board.
5. For group or class work.

During each of the four stages of the unit plan presented in an earlier chapter the blackboard may be used effectively. In the introduction and attack it may be used to record the purposes as they are stated, the suggested modes of attack, suggested learning exercises and readings, tentative committee memberships, and the outline of procedure finally derived from the discussion. Such records may be left on the blackboard for guidance during the study-and-work stage or changed as new ideas occur

¹ *The Object-Specimen-Model as a Visual and Other Sensory Aid, and a Blackboard Technique*, Educational Monographs, Vol. 1, No. 8, p. 53. State Department of Public Instruction, Harrisburg, Pennsylvania, 1929.

to the group. Also, progress may be checked on the blackboard and samples of work may be posted there, and freedom given to pupils to use the blackboard for practice work whenever they can do so with profit. During the integration-and-application stage the blackboard may be used again to summarize and organize work done, to illustrate reports, or to list conclusions. It is also of value during the appraisal-of-outcome stage for listing values derived from the unit, for final organization of the unit, for testing of ability, as in mathematics or foreign language, and for posting completed work of various types.

At all stages of the unit the teacher should use the blackboard frequently as he explains new points to the group. This does not require the teacher to be an expert in freehand drawing; rough sketches serve as well when accompanied by the teacher's running comments. The crude drawings not only clarify the points; they remain on the board for a time and by their repeated impressions aid retention as well. A good blackboard technique will add to the effectiveness of any teacher; it is a skill which should be acquired by all.

The School Journey or Field Trip

Before the Christian Era the Greek pedagogue took his pupils on trips as a part of their learning activities. Since formal education began, it has been realized that directed observation is an effective method of teaching and learning.

Purposes. Several very definite purposes have always been achieved by the school journey or excursion. They are of added importance to the modern teacher because of the increased opportunities for observation and the improved means of transportation. The purposes of field trips or excursions have been summarized as follows :

1. To serve as a pre-view of a lesson and for gathering instructional materials.
2. To create situations for cultivating observation, keenness, discovery — to encourage children to see and know the things about them.
3. To serve as a means of arousing specific interests — as in birds, trees, art productions, historical settings.
4. To supplement classroom instruction; to secure definite information for a specific lesson — as in arithmetic, civics, geography, literature.
5. To verify previous information, class discussions and conclusions, or individual experiments.¹

¹ *Visual Education and the School Journey*, Educational Monographs, Vol. 1, No. 6, p. 16. State Department of Public Instruction, Harrisburg, Pennsylvania, 1930.

In either the unit plan or a more traditional plan, purpose 1, "to serve as a pre-view," may be achieved by a well-planned field trip. Thus a general-science group might study rock formations at Pinnacle Rock or Eagle's Nest or the local equivalent of such scenic spots; a biology class might have regular bird-club trips in early spring; the art class will frequently study landscapes or, where available, visit art museums; the history student will go to the sites of historical significance; the social-problems group will visit courts, county courthouses, penal and eleemosynary institutions; the physics class will visit the light plant; and the chemistry class, the water plant. In each of these preliminary trips the group will receive an overview of the problem, provided the trip has been well planned; and in some of them instructional materials will be collected.

Well-prepared outlines of things to be observed will make the pupil alert and watchful. Not only will he be stimulated to see the objects and processes in the plan but his alertness will result in new interests as well. In each case his powers of observation will be exercised and his interests will grow.

Subsequent trips may be made to supplement the information carried in references. These may be taken by individuals or, if considered of sufficient importance, by the entire class. If no trip has been taken preliminary to the study of a unit, the entire group should go for the observation to supplement the discussions or to verify the conclusions.

Advantages. Several values have been implied in the foregoing discussion. These and other advantages of the field trip have been clearly set forth on page 15 of the monograph just quoted :

1. It shows natural phenomena in their proper settings.
2. It tends to blend school life with the outside world, putting children in direct touch, under learning situations, with things, persons, movements, relationships, environments, occupations, tendencies, trends, functionings.
3. It stimulates interest in natural as well as man-made things and situations, and enables students to know intimately their environment.
4. It involves the consideration and solution of problems arising from individual and group participations in natural social situations.
5. It affords opportunities to develop keenness and accuracy of observation and to experience the joy of discovery.
6. It sets up "a challenge" to solve, and thus stimulates constructive, creative thinking.
7. It helps children to organize their knowledge.

8. It develops initiative and self-activity, making pupils active agents rather than passive recipients.
9. It provides helpful practices, and thereby cultivates the habit of spending leisure time profitably.
10. It serves to arouse ambitions and determine aims.
11. It provides for valuable correlation of subjects.
12. It effects a genuine socialization of school procedure.

All twelve advantages may result from well-planned and well-executed excursions. A trip to a quarry, a court, or a forest, let us say, enables the pupil to see things in their normal settings, man-made or natural, which is a more direct approach to understanding them than reading. Bookish facts about pauperism take on new meaning after a visit to the county poor farm. Whatever the immediate purpose of a trip to a stream or a field, new natural interests will increase and a better understanding of natural phenomena will be developed.

Good planning of field trips frequently parallels the problem-solving procedure, with preliminary trips for collecting data and subsequent trips for verification of conclusions. Hence the problem-solving steps are applied to concrete situations, and pupils are given opportunity to observe and collect facts in their solution of difficulties which have challenged their attention. The entire process involved in the excursion, when well planned, demands co-operative activity toward desirable ends. Thus a trip to a dairy, for example, calls for co-operative listing of purposes; committee work to gain the permission of the owner, to arrange transportation, to study specified portions of the dairy, if all processes cannot be observed by all pupils, and to arrange subreports; and, after the trip, the findings are summarized by having each pupil contribute his part. The field trip, so conducted, is a genuinely socialized procedure.

That the field trip also breaks down the artificial barriers of subject matter and tends to correlate fields of knowledge may be illustrated by an excursion to a packing plant. To the success of the trip, agriculture contributes such facts as types and breeding of livestock for various packing needs, something of the care and feeding of livestock, and, in large centers, nature of regions from which stock is shipped; applications of physics and mathematics are to be seen in all the machinery; chemistry is observed in the treatment of by-products, in the sanitation of the plant, and in the curing processes; the whole industry is an illustration of practical economics involving labor, investment, transportation, and commerce; art is evident in the advertising division, in the displays, and

in the labels of packed products ; and any discussion of the source of the products, the nationality of the laborers, the markets for the products, and of related topics makes a heavy toll upon human geography. Thus it is clear that many fields of knowledge, divided by class schedules and other artificialities of the school, merge in the solution of the various problems which arise on such an excursion.

Administration. Various suggestions for planning and making field trips have been mentioned incidentally at several points in the discussion of advantages. They are summarized in definite steps as follows :

1. Study the community with a view to locating desirable places to visit. This should be done early in the school year, and tentative plans should be made with the property-owners. The teacher should also list the possible visits in his year's plan. The list will be supplemented during the year by suggestions from the pupils and perhaps by new enterprises of the community.

In general, all places should be listed that will reveal processes, specimens, and other things related to the content of a field of study. More specifically, classes in various fields may visit with profit such places as manufacturing plants, garages, retail establishments of various types, such as groceries for home economics, clothing stores for domestic or general art ; governmental agencies, such as courts, prisons, hospitals of all types, police and fire departments, municipal light, water, and sewage plants ; art museums, museums of natural history, and historical sites ; newspapers, banks, and post offices ; railway and bus stations, airports, and docks ; for natural science and agriculture, farms which have specialized in certain lines, such as dairy products, animal husbandry, horticulture, truck farming, and so forth ; spots of geological interest ; lakes or rivers for specimens of water life ; and appropriate spots for the study of other plants and animals.

2. At least a week before the trip is to be made, make final arrangements with the owner of the property to be visited, such as time of arrival ; specific points to be raised and studied ; route through the premises or plant ; guides, if needed ; points of danger, if any ; and other similar details.

3. Devote at least one class hour before the trip to preparing lists of questions to be answered, outlines to be filled, and materials to be taken ; to planning specific activities for various committees or individuals, to be carried out on the trip ; to explaining the procedures to be followed while observing ; to arranging details of transportation ; to warning of dangers ; and, if necessary, to suggesting points of conduct and courtesy while guests of the owner who has made the visit possible.

4. Make the trip during regular school hours, usually, and in a school bus if possible. In any event have a responsible adult in charge of each

motor-driven vehicle. Longer trips may be made occasionally, outside of regular school hours, consuming a half-day or even a whole day. Sometimes Saturdays are devoted to field trips; one biology teacher takes his bird club on a trip each Sunday morning during the spring months.

5. During the tour assist individual pupils whenever need arises, and keep their interest at a high pitch by questions, suggestions of new points, and explanations of the things being observed. On some occasions the guide will aid materially in such matters.

6. Devote at least one class hour to discussing the questions the trip has answered and to organizing and summarizing the results. At this point new questions frequently arise which sometimes demand a second trip by the entire group or by a special committee.

7. Record the results of the trip, with suggestions for improvements on the next trip or on the same trip the next year. A courteous note to the person or firm visited is in order also. The note should be written for the class by a committee selected by the class.

From the foregoing presentation of the purposes, advantages, and administration of the field trip or excursion it is clear that this visual aid to learning is one of the more valuable modes of instruction. Although more space has been given to the school journey in this chapter than to other types of visual aids, the subject is by no means exhausted; the student is referred to the bibliography for further study.

Dramatization

Any type of dramatization — formal or informal — very likely has greater value for the performers than for the observers, although both actor and audience profit from dramatic activities. Writing the dialogue, studying customs to determine costumes and stage properties, research to verify accuracy of accounts upon which a play might be based, are perhaps of more significance than the actual learning of lines and presentation of the play. The preliminary activities give opportunities to a larger number of pupils and bring initiative into action more than the subsequent production can. This is true of the informal dramatization as well as of the formal play. To illustrate, one history class devoted an hour to a conversation by Jefferson, Franklin, and Washington. The three boys who did the actual talking had previously made an intensive study of all three men and were able to chat about events of the Revolutionary period in the language and with the viewpoints of the three men. The occasion was informal, without stage settings or costuming, but the entire class was alert to check against anachronisms and errors of fact or

viewpoints, all the pupils having previously studied the men and their period. The conversation summarized the work of the unit in a very effective manner as the three famous Americans chatted about the chief problems of their day.

The chief disadvantage of dramatization is the expenditure of time required for effective production. This difficulty can be offset to some degree by giving less attention to costuming. On the other hand, accuracy of fact should not be sacrificed to save time. It is better to give ample time to a few well-ordered dramatizations during the year than to use the procedure in its larger aspects as a regular class activity.

Practically every unit contains possibilities for short, informal, and perhaps extemporaneous dramatization, however, and such possibilities should be realized frequently. In English or in social studies news events may be acted out with little preparation; debates may be presented to emphasize opposing views on any social problem; impersonations of historical, fictitious, or current characters may be given, with or without costuming, with little preparation; or brief dialogues may be prepared and presented bearing upon any point of interest. In science important scientific discoveries may be dramatized, the effects of inventions may be disclosed in dialogue, or something of the dramatic may accompany almost any demonstration.

Pageants, though often time-consuming to an unwarranted degree, offer excellent opportunities for learning. They may be used to depict customs, events, trends, and even processes, in an effective manner. They are highly stimulating to constructive study of whatever is being presented and constitute a highly socialized form of learning. Incidentally they sometimes afford an excellent medium for interpreting the work of the school to the public.

Demonstrations

The research findings reported earlier in this chapter indicated that the demonstration is as effective as the motion picture. Other research has shown the demonstration to be as effective as the individual laboratory experiments under many conditions. Consequently the demonstration should be given a place of first rank in teaching procedures.

A capable student can perform many demonstrations as well as the teacher and should be given the opportunity to do so. Also, groups should frequently have complete charge of the demonstrations. These practices throw the responsibility upon the pupil, stimulate keener interest on the

part of the demonstrating student at least, and may also be used as a recognition of accomplishment or ability.

Whether the teacher or the pupil performs the demonstration, the following principles should be followed :

1. The demonstrator should understand the entire procedure thoroughly before attempting to demonstrate it to others.
2. All apparatus and supplies which will be needed for the demonstration should be set up or laid out before the group convenes for the observation.
3. The group, as well as the demonstrator, should know in advance of the demonstration its relation to the unit, its purpose, the general procedure to be followed, and the apparatus and supplies needed.
4. During the demonstration the one in charge should make running comments relative to materials, amounts, processes, and results, and should respond freely to questioning.
5. At the end of the demonstration ample time should be given for a discussion of procedure and results and for the drawing of inferences.
6. As a general practice subsequent tests should cover the points learned from the demonstration. The tests should be administered to ascertain whether the demonstration has been effective rather than to stimulate attention during the process, although the latter result also is achieved when students know in advance that a test will follow.

Graphs and Diagrams

The wide use of graphs and diagrams in periodicals and in advertising suggests their effectiveness as a medium of expression. This same wide commercial usage also simplifies the teacher's task of preparing graphs, because many may be clipped from the newspapers, although those used in advertising or other propaganda should be accepted critically.

Several of the more effective types of graphs or diagrams for classroom use are as follows :¹

1. The bar graph, for picturing relative amounts : for example, lines or bars might be drawn to represent the average number of inches of rainfall per year in various sections of the United States.
2. The circle graph : for example, to show by differently shaded sections of a circle the amount of tax money spent for crime, schools, roads, and other specified purposes.

¹ For a more complete treatment see pages 98-114 of Anna Verona Dorris, *Visual Instruction in the Public Schools*. Ginn and Company, 1928.

3. The curve graph, to show changes or trends: for example, the decrease of illiteracy in America at ten-year intervals over a fifty-year period.
4. The picture graph, to reveal relationships or to present facts: for example, to show the populations of leading nations by a series of pictures of typical citizens ranging in size according to national population.

Since constructing the graphs is in itself a valuable learning exercise, more of them should be prepared by the class than by the teacher. Pupils should be given the graph habit both as a mode of expression and as a method of reading. Practically every unit offers opportunities for the use of one or more types of graphs.

Maps and Globes

The map is one of the oldest of the visual aids and one of the most valuable. A partial list¹ of types of maps or globes includes the political map, to show national or other boundaries; the relief map, with either flat or raised surface, to show elevations and depressions of the earth's surface; population maps, dotted to show density; temperature or rainfall maps, to show areas shaded for various temperature or rainfall ranges; product maps, to show the sources of natural or man-produced commodities; outline maps, to serve various study and testing purposes.

The social studies require the use of one or more kinds of maps almost daily. The teacher should anticipate their use as he plans his instructional activities and have them available when needed.

Much time has been wasted in schools by requiring pupils to prepare maps. It used to be considered a serious offense to trace over a printed map to obtain an outline. The printed outline map is now accepted as the starting point for much map work, and little time is wasted on faulty free-hand drawing of maps of any type. Filling in outline maps and preparing relief maps from sand, papier-mâché, or other compositions are desirable activities if used moderately.

Pictures

In addition to using pictures in textbooks the teacher should draw heavily upon all available pictorial material from current publications, from companies which specialize in pictures for instructional purposes, from advertising leaflets and folders, and from government publications.

¹ Ibid. pp. 114-134.

A picture committee is in order for every learning unit, and all other pupils should be encouraged to contribute pictures bearing upon the problems of study for use on the bulletin board or in picture files. The teacher should build up in his files a series of well-selected pictures for every unit, to be displayed or otherwise made available for each class which pursues the unit.

Carefully selected pictures may be used during each stage of the unit. Six or eight appropriate pictures will introduce a new problem more rapidly than any other method. A part of the study-and-work stage might well be the collecting of relevant pictures and the observation of those previously filed. Arranging pictures to correspond with the logical sequence of the unit and binding them in booklets are valuable integration techniques. Such collections bear evidence of the outcomes of the study. Sometimes matching tests, based upon pictures, may be used for measuring achievement.

Cartoons

What has been said of pictures in general applies to cartoons as well. In addition, pupils with ability to draw should be encouraged to prepare cartoons to represent the discussion of the class, and proper recognition should be given to such effort.

The humor or satire frequently linked with the cartoon makes it one of the most potent instruments of propaganda. The same qualities make it a valuable tool in the hands of the teacher.

Bulletin Boards

The bulletin board may be used for the first display of graphic, pictorial, printed, or class materials pertaining to current or future units. The teacher should obtain sufficient bulletin boards to provide definite space for each class and should delegate the care of the respective sections to one pupil in each class. To this pupil materials for posting should be forwarded by all other pupils and by the teacher. A small section may be reserved by the teacher for posting official notices, assignments, reference lists, and other routine materials. Materials should be left on display only so long as they are of value; then they should either be destroyed or be filed for future classes.

An attractive, well-kept bulletin board can be made one of the most stimulating aids in the classroom. Some teachers assume that all pupils read or study everything displayed on the bulletin board and regularly include such material in class discussions and tests. Considerable effort

is needed to use the space properly, but a capable pupil can be trained to do it efficiently. The results are well worth the effort of both teacher and pupil.

Sand Tables

One of the most interesting exhibits at A Century of Progress was the relief display of the Ford Motor Company, illustrative of sand-table techniques. At a glance the observer could see the source of timber, iron, and coal; the routes by which the raw materials reached the factory; and the various assembling plants. In our crowded modern classrooms the sand table has the serious disadvantage of consuming fifteen or twenty square feet of space; but where there is sufficient space, it can be made as valuable an aid in the secondary school as in the elementary school. Dent¹ states that the sand table "is probably the most adaptable of all visual aids. It may be used from the earliest pre-school or play activities through all the grades, high school, college, university, in the army, in engineering, in landscape gardening, in real estate selling, and in many other walks of life." It is particularly valuable in the secondary school in the social studies and in the biological and geological sciences. Frequently materials less shifting than sand are used, such as clay or papier-mâché.

Exhibits, Specimens, Models

The teacher of social studies, literature, art, or biological and physical science should make frequent visits to local museums or other collections relevant to his field. He should also gradually build up a school museum if funds and space can be made available. At least he should have an adequate supply of classroom specimens and models.

Such supplies have an advantage over pictorial materials in being real objects which may be handled and inspected in addition to being seen. On the other hand, they are more expensive, more space-consuming, and more difficult to preserve. Careful plans should be made for the frequent use of all materials of this nature.

Stereoscopes and Stereographs

The stereograph renders a three-dimension view when used in a stereoscope and thus is superior to the usual flat picture. The view is often more realistic than the motion picture and figuratively carries the observer

¹ Ellsworth C. Dent, *A Handbook of Visual Instruction*, p. 21. Brigham Young University, 1934.

to the scene he observes. The stereograph is most valuable for individual study, since it is usually impracticable to supply enough stereoscopes and copies of the same stereograph to permit all pupils to observe the same view at once as a basis for discussion. Stereographs are also very valuable for review and for enrichment beyond the regular class activities. Sets upon many topics are available at reasonable prices and are economical because of their durability. They may be used effectively at any stage of the unit, in the same way that flat pictures are used.

Stereopticons and Slides

There should be readily available for every class a stereopticon and assortments of slides for each subject. The slides may be purchased from reliable companies, or they may be rented from libraries, the government, or extension divisions of universities, or they may be made from etched glass sold in standard size ($3\frac{1}{2}$ by 4 inches) for the purpose. The last method has the additional value of the activity involved in making the slides. The drawings may be made with colored pencils or colored ink. Blank slides made of cellophane are available also and may be finished with India ink or on a typewriter by using ordinary red carbon paper. This type of slide is especially valuable for outlines, assignments, and summaries of reports and may be very easily prepared by a pupil or the teacher.

Some companies have specialized in preparing slides for numerous topics similar to the stereographic sets previously mentioned. The slides when projected upon the screen may be used singly for purposes of analysis or in series with running comments to present an entire topic. Either method adds much to the typical lesson procedures.

In recent years the disadvantage and inconvenience of darkening the room for projection have been reduced by daylight screens. Although the views are not as clear, this equipment saves time and prevents the inattention which a darkened room usually causes.

Certain preparatory activities should precede the showing of the slides, and follow-up work likewise is necessary, as with the field trip. Discussion should have stimulated a number of questions and problems; the pupil should have learned to differentiate the parts that are relevant to the problems from the parts that are irrelevant; time should be allowed for discussion during the showing of the views, and for running comments by the teacher or by a pupil who has become well prepared for the task; summaries are essential after the showing, during which some of the

views may be reshown; pupils should be encouraged to follow leads suggested by the slides; and problems covered by the slides should be included in tests. These procedures make the slides a portion of the regular classwork and offset the attitude which causes the pupil to consider them purely as entertainment.

Projection Machines for Opaque Materials

It is frequently of value to show on a screen or a blackboard the textbook illustrations or diagrams and similar opaque materials from other sources. This may be done with a projector designed especially for such materials. It is more economical to use a stereopticon equipped both for transparent and for opaque materials than to purchase a machine equipped for only one type. Such dual-purpose machines are now available.

The views from opaque materials are not always as clear as those from glass slides, but they are effective visual aids and of course are less expensive than the glass or even the cellophane slides. In general, they serve the same purposes that the stereopticon slides serve.

Still Films

Purposes similar to those of the stereopticon slide and opaque projection are achieved by the still films. This visual aid consists of a series of pictures on one strip of film arranged for automatic use in a stereopticon. The series may be of any desired length, and the pictures in the series are arranged in the supposedly best learning order. The adjustment permits of reversing, so that any picture in a series may be reshown as frequently as desired during the showing of a series.

The still film may be purchased blank and the pictures or diagrams drawn with colored inks or pencils. The cost of the blank or prepared films is considerably less than that of corresponding glass slides.

Silent and Sound Motion Pictures

Much of the research and experience reported earlier in this chapter dealt with motion pictures. The chief advantages of motion pictures as aids to learning may be summarized as follows:¹

1. *Motion may be studied.* The motion to be studied may vary from slowing down the movement of a race horse or any other rapidly moving object, for the purpose of studying form, to the speeding up of the growth

¹ See also E. C. Dent, op. cit. pp. 64-66.

of a plant to show its development. The same principles that apply to visible objects in this connection also apply to microscopic forms.

2. *All fields may be enriched.* Well-selected motion pictures, silent and sound, fulfill practically all the functions of visual aids discussed at the beginning of this chapter; they give correct initial concepts, broaden sensory experiences (the sound pictures fulfill this function doubly), intensify impressions, vitalize instruction, give vicarious experiences not otherwise possible, motivate, supplement other learning, and vary classroom activity.

The chief disadvantage of the motion picture for school use is its expense. This disadvantage is reduced by the availability, usually for transportation costs only, of numerous films through governmental and educational agencies. It is usually the practice of the loan agencies to book films for short-time loans, however, which reduces the effectiveness of the showings. The film should be kept long enough for a preview by the teacher, a normal showing for the initial impression, a slow showing for study and discussion, and several days later a review showing for summary and final discussion. It should be realized, however, that a single showing is usually worth all the expense involved. Talking pictures or other sound films are the more effective type of motion picture, although it is sometimes advisable to run them once with the sound attachment disconnected. The sound may be eliminated whenever the teacher prefers to give his own lecture with the film.

Certain other hints for the use of motion pictures follow, adapted from the suggestions of Dent : ¹

1. The motion picture should be used where it will contribute most to the understanding of a subject; that is, to introduce the subject, as a part of the laboratory or study period, or as a review.
2. It should be used directly in connection with the content being studied, preferably to answer problems which have been derived from discussion.
3. The reverse mechanism should be used sparingly.
4. When possible the pictures should be shown in the regular classroom.
5. The pupils should be made to realize that the showing is not an entertainment but a part of their learning activities. Test items may be drawn from the reels to check the success of the pupil's observation.
6. The teacher should co-operate with the administration in releasing the equipment according to schedule and in reporting needed repairs.

¹Op. cit. pp. 66-67.

The motion picture is unquestionably one of the most potent forces in modern life. Education has just begun to appreciate its power as an aid to learning. That its full value may be realized, every classroom should be equipped with electrical fixtures for the motion-picture projector, every school system should be supplied with the machines, and every teacher should have specific training and actual experience in the use of the motion picture not only as an aid to learning but also as a *mode of learning*. Before 1936, national authorities had taken certain definite steps to facilitate the production of effective educational films and to aid in their distribution to schools.¹

Sources of Visual Materials

At various points in the foregoing discussion of types of visual aids reference has been made to their availability. At other points the sources have been named. Because of the temporary nature of some of the sources, the fluctuations of market prices, and the limited space here available it is impracticable to list the sources in detail. Some practical value will accrue to the reader, however, from a general treatment of four main sources which are always available, regardless of change in market and price.²

The Government

Through the official organ of the Office of Education, a monthly journal,³ teachers throughout the nation are notified of free aids and of those available from the Federal government at cost. In writing of the availability of motion pictures Koon⁴ lists the following agencies of the Federal government as active in the production, distribution, or use of motion pictures and states that the films are usually available upon payment of transportation charges :

1. Department of Agriculture
 - a. Office of Motion Pictures
2. Department of Commerce
 - a. Motion Picture Section, Bureau of Foreign and Domestic Commerce

¹ Consult the senior specialist in radio and visual education, Office of Education, Department of the Interior, Washington, D.C.

² Excellent detailed lists of sources, most of which are still current, may be found in volumes entirely devoted to visual education. Of particular value are the lists compiled by Koon, Dorris, and Dent, in the three books by those authors listed in the bibliography at the end of this chapter, and in the Office of Education Circular No. 150, by Cline M. Koon, also there listed.

³ *School Life*. Available from the Superintendent of Documents, Washington, D.C., at one dollar per year.

⁴ Op. cit. p. 23.

3. Department of the Interior
 - a. Branch of Research and Education, National Park Service
 - b. Division of Reclamation Economics, Bureau of Reclamation
 - c. Motion Picture Production Section, Bureau of Mines
 - d. Radio and Visual Education Section, Office of Education
4. Department of Labor
 - a. Division of Publicity, The Women's Bureau
 - b. The Children's Bureau
5. Navy Department
 - a. Bureau of Navigation
6. Treasury Department
 - a. Division of Venereal Disease, U. S. Public Health Service
7. War Department
 - a. Army Pictorial Service

A brief letter of inquiry regarding visual aids to any of these agencies or to the Office of Education will bring detailed lists of current available materials.

Many state departments of education maintain divisions of visual education which not only supply materials but also issue bulletins on the problem. Other branches of any state government, particularly the departments of agriculture, mining, forestry, conservation, fish and game, and highways, frequently have valuable materials for free distribution to schools. School officials or teachers should make inquiry of their state department of education regarding all materials and aids from the state government.

Educational Institutions

The extension divisions of most state universities have films and slides for rental purposes. Public libraries and museums of art or natural history likewise serve the schools by renting pictures, films, and slides. A current list of available aids may be had for the asking.

Industry

Visual aids which show the manufacturing processes of various products are available from many companies as advertising. Some of these are in picture form, and others are the real products drawn from the various processes of manufacturing. Still other companies have slides and reels for school use at nominal rental charges. Current lists of such aids may be procured from state departments of education or directly from the educational divisions of the companies.

Advertisements

Every educational journal carries current announcements of the firms which produce and sell visual aids. Catalogues from school-supply houses also give current prices on commercial visual aids of all types.

In addition to these four sources of aids, there are also current periodicals and local field trips, both of which offer almost limitless opportunities for visual instruction. Certainly the alert teacher should find ample facilities for applying the principles of visual education and gaining its advantages for his pupils.

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CHAPTER XIII · The Radio in Education

GENERAL VIEW OF THE CHAPTER

Purpose of the Chapter

Historical Sketch

Functions of the Radio in the Classroom

Techniques for Using the Radio in Instruction

The Radio and the Unit Plan of Instruction

Creative Activity through Pupil Broadcasting

Difficulties That Are Being Overcome

Research in Education by Radio

Radio Material for Classroom Use

Selected References for Further Study

Purpose of the Chapter

SINCE 1920 the radio has become one of the most vital factors in the civilized world. It touches every phase of social life. It has become a major instrument of propaganda of all types — political, commercial, religious, educational. In the field of education the voice of the radio is an ally of unlimited potentialities outside the classroom as well as within. Its powers as an instrument of enlightenment have unfolded as the ingenuity and imagination of educators have found new tasks for it to perform. Although still in its infancy the radio has passed its experimental stage and has become accepted by educators as standard school equipment. Consequently a discussion of the educational usages and advantages of the radio is of immediate and practical value to the prospective teacher.

The present chapter offers a brief historical sketch of the development of the radio and sets forth the practices which have been developed in its use as an educational aid. An attempt is made to answer such questions as the following: What are the functions of the radio as a teaching or learning device? What techniques and skills should be mastered by the teacher, and what difficulties surmounted before the use of the radio can be perfected in the unit plan and other modes of instruction? How has research in the use of the radio in education aided the teacher? What radio facilities are now available for classroom use?

Historical Sketch

Something of the nature of electric currents was learned by leading physicists even before the middle of the nineteenth century. The findings of these scientists and their successors, together with his own mathematical analysis of the problem, caused Clerk Maxwell, an English mathematician, to conclude in 1873 that high-frequency alternating currents, flowing in a circuit, would give rise to electric waves in the surrounding space. Fourteen years later Heinrich Hertz, a German physicist, first experimentally detected such waves. Guglielmo Marconi, the Italian scientist, is credited with the actual discovery of radio, or "wireless," however. In 1896 Marconi first caused Hertzian waves to radiate from a transmitting antenna. During the next few years he increased the distances of the points to which his messages could be sent. In 1899 he first sent radio messages in telegraphic code across the English Channel, and in December, 1901, he transmitted such messages from St. John's, Newfoundland, across the Atlantic to Poldhu, England. During the next fifteen years radio became a fad in America, especially with men and boys. By 1913 there were twelve hundred licensed amateur radio transmitting stations in the United States. The number increased to more than twenty thousand within the next ten years.¹ The American Radio Relay League, an organization of amateurs, had grown to such size in 1917 that it was appealed to by the government to aid in supplying radio operators for the World War.

Transmission of the voice had been achieved before America entered the war. In 1915 a group of radio engineers had succeeded in speaking from Washington to Paris by radio. Five years later the first American commercial radio stations were opened, KDKA in Pittsburgh and WWJ in Detroit. The first regular broadcast service was begun November 2, 1920. It opened with broadcasting over KDKA the Harding-Cox election returns. After 1920 the development of broadcasting was very rapid. In 1921 regularly scheduled radio programs of music and speech went on the air. More than a million receiving sets were installed in American homes before the end of 1922. The number had grown to 6,500,000 by 1927, and to approximately 20,000,000 by 1935.

¹ "Biennial Survey of Education, 1928-1930," *United States Office of Education Bulletin No. 20*, 1931, Vol. I, p. 622. Government Printing Office, 1932. (A statement from Dr. Cline M. Koon, of the United States Office of Education, reveals that there were approximately seventy thousand radio amateurs in America in 1935.)

The first large American school system to install radio was the New York City system. The order for the installation was passed February 18, 1924. The year before, the Haaren High School in New York City had given lessons by radio. This school "appears to have the honor of being the first public school to give instruction by radio."¹ The radio lessons were first started there in accounting, shorthand, and business arithmetic. Other school systems soon adopted the idea: Oakland, California, in 1924, Cleveland in 1925, Atlanta in 1926; and others followed rapidly. By 1927 fifty-seven high schools in Massachusetts were equipped with radio receivers. So rapid has been the application of radio to education that by 1935 no secondary school in America was considered fully equipped unless it had at least one receiving set. In more than one thousand secondary schools instruction by radio has become a well-established part of the instructional program.²

The following quotation reveals a similar trend in various European countries:

Broadcasting for schools developed in England, Germany, and other foreign countries at the same time that it was developing in the United States. Most of them developed plans for radio broadcasting which prevented a multiplicity of stations with consequent interference. England's school broadcasting was started experimentally in 1923 and has been developed systematically from year to year. The Danish programs are said to be at least equal to those in any other country. Germany, too, has an excellent system. Reports from 45 countries, collected by the United States Department of State, are included in the Report of the Advisory Committee on Education by Radio appointed by the Secretary of the Interior.³

In 1931 about twenty thousand of the fifty-five thousand schools in Germany were equipped with radio.⁴

It is thus quite clear that the radio is not a fad in education. It has come to stay and will increase in its usefulness as a part of the educational program and equipment of every school.

¹ Ibid. p. 628.

² Exact data were not available as to the number of public schools making definite use of the radio in 1935. Dr. C. M. Koon, senior specialist in radio and visual education, United States Office of Education, in a letter written September 24, 1935, stated that according to the available data "between 5 and 7 per cent of the public schools make systematic use of radio for instructional purposes and at least 20 per cent use radio programs occasionally."

³ "Biennial Survey of Education, 1928-1930," *United States Office of Education Bulletin* No. 20, 1931, Vol. I, pp. 631-632.

⁴ "The Use of the Radio in German Schools," *Elementary School Journal* (November, 1932), 33: 174-175. (Editorial comment.)

Functions of the Radio in the Classroom

The radio has been called one of the most powerful cultural forces in American life. This reference pertained largely to the influence of radio outside the classroom, a field with which every teacher should be familiar but which cannot be treated in the present volume.¹ Although the radio is a relatively new part of teachers' classroom equipment, nevertheless it has established several claims which may be set forth as values or functions.

At the outset it should be clearly understood that the radio, like the various visual aids treated in the preceding chapter, has as its primary function the increase of perceptual images. Learning is dependent in large measure upon the creation of audile and visual images in the mind of the learner. The radio and the visual aids have become of increasingly great value as agents for the creation of the two types of perceptual images, respectively. The specific functions of the radio and of visual aids are similar at some points. There is also some overlapping among the several functions of the radio. For the purpose of analysis, however, the various functions of the radio as a classroom device should be considered separately. They are as follows :

To Supplement the Work of the Teacher

Early enthusiasts of the radio erroneously predicted that a few master teachers would eventually, by use of the radio, replace many classroom teachers. The fallacy of this prediction soon became apparent when unexpected services by the classroom teacher became essential to make the school broadcasts successful. Now it is realized that the radio should attempt only to supplement the work of the teacher.

To Supply Firsthand Information

The radio brings into the classroom from original sources recent discoveries in science, accounts of social and economic events and of national and international affairs, news of the world of sports, and other types of firsthand information which the skillful teacher uses to keep his subject alive and meaningful to secondary-school pupils. The charm of magic and mystery which the radio still carries and the unquestioned authority

¹ See Tracy F. Tyler (editor), *Radio as a Cultural Agency*. National Committee on Education by Radio, Washington, D.C., 1934. See also Herman S. Hettinger (editor), "Radio: the Fifth Estate," *Annals of the American Academy of Political and Social Science* (January, 1935), Vol. 177.

of the speakers make the mind of the listener receptive. It is quite probable that these influences tend to make the impressions lasting. Furthermore, the new information acquired from the radio offsets the bookishness of other sources and convinces the pupil of the value of the content. The new, up-to-date material gives a glow of recency to the entire course.

To Bring the Voices of Outstanding Speakers into the Classroom

Through the radio "pupils catch enthusiasm from the direct contact with the dynamic leaders of our times."¹ For the first time in history every school child may hear the voices of Presidents and other political leaders, of scientists and explorers, of heroes and heroines in every realm of endeavor. It makes little difference whether the inspiration comes during school hours or while the pupil is at home, the result is the same; the child's life is touched by the great of his time.

To Bring the Pupil in Touch with Realities

When Churchill broadcast to the world after his famous meeting in the Atlantic with Roosevelt, the youth in every English-speaking land felt a nearness to the two leading champions of democracy. Floods, earthquakes, and tornadoes; celebrations, parades, and expositions; sports, amusements, and explorations; peace conferences, youth movements, and political campaigns; new inventions, new records, and new theories; and all other conceivable aspects of modern life are brought to bear upon the consciousness of the school child through his home radio and his school radio. Vital content for almost every school subject comes over the air daily, bringing the entire world to play upon the mind of the learner. The teacher's problem is that of selecting the best and of training the pupil likewise to exert discrimination.

To Enrich the Offering

This function of the radio applies to all pupils but more especially to those who have completed the regular offering. For example, one enterprising rural teacher placed a partition in one end of the room and permitted accelerated pupils to listen whenever programs of value were on the air.² It is a particularly valuable exercise for all children, especially those whose abilities are not absorbed by the regular work, to hear pro-

¹ *Radio, a Powerful Ally*, a leaflet prepared by the National Committee on Education by Radio, Washington, D.C., 1934.

² Wayne Soper, "Radio in the Rural Schools," *School Executives Magazine* (January, 1932), 51: 210.

grams relevant to the course and to report on them to the group. Pupils soon acquire the habit of seeking programs at home and at school which bear upon their work and of contributing from those programs during subsequent class discussions.

A more regular method of using the radio for enrichment is the plan, to be discussed later in this chapter, by which the entire class prepares for the program, listens, and follows up with appropriate exercises.

To Give Variety to Classroom Procedure

Like visual aids the radio offers the teacher a procedure different from the usual classroom routines. It does not, however, offer the pupil a method of learning which requires no effort on his part. The newness and the mystery of the radio appeal to all pupils and thereby cause those little interested in other procedures to react favorably to the new learning situation.

It should be understood that no teacher should use the radio solely because it offers a different classroom procedure. Unless the program gives promise of a distinct contribution to the unit of study, it should not be used. A careful investigation of the program by the teacher and thorough preparation by the pupils for its reception should precede tuning in.

To Develop Interest

The nature of the program, as well as the factor of variety, stimulates interest. The varied offering of the radio gives opportunities in numerous fields for development of new interests. The Damrosch programs and others have developed interest in music, numerous news-reporters have stimulated work in social studies and other fields, while historical plays and masterpieces in drama have awakened new interests in history and literature. Primary attention is challenged by the instrument itself and, by this appeal to curiosity, special interests are stimulated.

To Develop Self-activity along Desirable Lines

The radio does not eliminate the need for self-activity by pupils. Instead it stimulates two general types of activity: those which precede tuning in and those which follow the program. Both types of activities give opportunity for the exercise of initiative and ingenuity, and both result in self-expression. The various activities of pupils before and after the broadcasts are treated in detail in a subsequent section of this chapter.

To Teach Pupils to Take Notes Accurately and with Facility

During the broadcast it is necessary for pupils to take notes on the program. They should be taught to discriminate and to arrange their notes in systematic order. The intensity of their interest while the program is in progress and the knowledge that the speaker is not in position to repeat are factors which are not always present in the usual situation. The one creates the desire to perpetuate important parts of the program in notes, and the other stimulates promptness and accuracy in recording the main points. The teacher should give attention to the techniques of note-taking until every pupil has learned to record essential points with facility.

To Teach Pupils to Listen Intelligently

Intelligent listening is an important part of the learning process. This aspect of learning becomes increasingly important as the pupil advances through high school and college and as he leaves school to engage in other activities. The pupil is inclined to listen with full attention because he realizes that he must get the meaning from the one presentation. Whether or not this attitude toward listening will carry over to any large degree awaits experimentation, but the supposition is that it will carry over to numerous like situations.

To Set Standards of Speech

With the development of radio announcing as a profession the programs very likely will be presented in increasingly higher standards of speech. Secondary-school pupils will hear speakers carefully selected for their ability in English and for their excellencies in voice qualities and usage. Teachers of speech will have instructive illustrations available frequently, although not invariably ; and pupils in all subjects, when care has been exercised in the selection of programs, will repeatedly hear discussions in which a high quality of speech ability is demonstrated.

To Broaden the Pupil's Outlook

The child in the remotest rural district may attend all the types of programs previously mentioned. He hears speeches — social, political, and religious — of his own nation and of other nations, news from all important centers of the world, actual national and religious celebrations of other peoples, and other important programs which carry him to all parts of the world. These experiences compete with the narrow traditions of his local environment for a place in his outlook upon life.

To Enable the Teacher to Study His Class at Work

During the broadcast the teacher has an excellent opportunity to observe his pupils' methods of work. His observation will include not only the note-taking and other listening-in techniques but also the pupils' methods of performing tasks suggested by the broadcast. Thus the radio relieves the teacher of directing the activities and sets him free for a more thorough diagnosis of individual needs than he would otherwise be able to make.

To Demonstrate Superior Teaching

Radio teachers, as a rule, have been selected because of their competence. Where this is the case, every radio lesson becomes for all listening teachers a demonstration of superior teaching and should gradually improve classroom techniques. Superintendents, principals, and supervisors, as well as the teachers themselves, should make full use of the radio as an instrument for the improvement of instruction.

To Facilitate the Administration of the Educational Program

A value of the radio which was less anticipated than others in the earlier days of the radio but which has recently acquired considerable significance is the aid it renders administrative officials, and the teachers and pupils who co-operate with them, in maintaining school policy and in carrying out minor administrative details. A few superintendents and principals abuse the privilege which the public-address system offers by using it as a new toy and too frequently interrupting single classes or the entire school by petty announcements whenever the whim strikes them, particularly when visitors are in their offices. Others curb such impulses and study with their staffs the problem of how the instrument may be of real assistance to sound administration. Such planning results in well-defined policies and effective practices with respect to the nature and time of announcements, student and staff participation in broadcasting to either school or community materials of administrative significance, and other administrative or semi-administrative problems.

The co-ordination of all educational agencies of the community is essential to effective administration of the broad educational program of a community. It is not of primary importance that the school lead in a plan for co-ordination, but the school should give intelligent co-operation. The radio is a valuable aid in any community which seeks to co-ordinate its various educational agencies. The experience in Rochester, New York,

is an illustration of effective use of the radio in this connection. In describing the Rochester School of the Air, the director of visual and radio education of that city makes the following comment with respect to the value of the radio as a co-ordinating influence:

School radio in Rochester has proved to be an effective co-ordinating medium for other community agencies whose objectives are closely allied to those of the schools. Since 1934 the Rochester Public Library has offered a series of programs as the Rochester School of the Air that not only fit well with classroom instruction but, in addition, have stimulated boys and girls and teachers, too, to take a greater interest in the services of the library and to make use of its facilities.¹

To Promote Adult Education

The implications for adult education which arise from the preceding paragraphs are many and varied. Any phase of living which the educational forces of the community wish to improve may first be reached through radio announcements and subsequently conducted at least in part through radio programs prepared by the school. During the Second World War numerous communities used this plan for safety education, for health and nutrition, for study of war aims and postwar problems, for stamp and bond campaigns, and for various other educational problems of significance to local communities. In many cases this plan was followed by more extensive programs of adult education. Such work has not been limited to public-school systems. Colleges and universities have used a similar plan, an illustration of which is the Family Life Institute of the Extension Division of the University of Oklahoma. Opportunities for using the radio for adult education may arise in any class which discovers shortages in community living, especially classes in social studies, in science, or in homemaking. Proper follow-up of the discovery includes conferences with the school officials and with lay leaders, and eventually a carefully prepared radio broadcast that will lead toward constructive educational measures for overcoming the shortage. The eagerness of the adult population for educational broadcasts is revealed by the fact that one third of the fan mail received by the American School of the Air one year in response to its broadcasts to schools came from adults in no way associated with the schools.² This unexpected result suggests the

¹ Paul C. Reed, "The Rochester School of the Air," in Irvin Stewart, *Local Broadcasts to Schools*, Chapter IV, p. 100. The University of Chicago Press, 1939.

² William Chandler Bagley, "What the Future Holds for Broadcasting in the Schools," *School and Society* (May 30, 1931), 33: 713-716.

possibility of educational programs for adults, a problem outside the scope of the present volume. The point is clear, however, that broadcasts prepared for classrooms wield a strong influence upon large numbers for whom they are not primarily designed.

To Stimulate Public Interest in Education

Still another outcome of classroom broadcasts not originally planned but subsequently accepted as a legitimate function is the stimulation of interest in public education. It was soon discovered that parents frequently listened to the broadcasts which their children were receiving at school and that the parents thereby became more interested in the work of the schools.

Techniques for Using the Radio in Instruction

The techniques to be employed by the classroom teacher in making effective use of the radio in instruction may be classified under preparation, reception, and follow-up.

Preparation

Thorough preparation for using the radio requires the co-operative action of the broadcasting system or station, the administrative officials, the teachers, and the pupils. The broadcasting station, whether operated by an educational institution, by the local school, or by a commercial company, has several important requirements to meet. In the first place, the programs broadcast to schools should be adapted to the pupils for whom the broadcast is intended. Their abilities and their level of scholastic achievement should be considered in the selection of content. A second requirement is somewhat more difficult to achieve, that of articulating the program with the work in progress at the time of the broadcast. If the broadcast is presented by the local school or even by an educational institution within the state, this requirement may be met reasonably well by paralleling the local or state course of study. But considerable care must be exercised by sectional or national broadcasts in selecting content fitted to the current work of a large proportion of the schools. A third task of the station is to prepare its program far enough in advance to permit teachers to include relevant content in their plans for a semester or a year. Complete programs and teacher's manuals for the school year should be available at the beginning of the term. The manual, if prepared for a wide territory, should include a list of co-

operating broadcasting stations; a daily schedule showing the topic, the day, and the hour; and a syllabus for each field to be covered. The syllabus should elaborate the topic, suggest references for teacher and pupil, recommend visual aids to accompany the broadcast, prescribe exercises for pupils to perform before, during, and after the broadcast, and in other ways aid in the understanding and appreciation of the program.¹ Another important requirement for the station or system is that the broadcasting teacher be an expert both in the art of teaching and in the art of speaking. If the teacher's use of the radio is to be successful in any large measure, the station must meet all these standards.

The administrative officials likewise have essential obligations to meet if the maximum value is to be derived from the classroom use of the radio. Of primary importance is the provision of classrooms easily made free from distracting noises yet well ventilated. The officials should also furnish materials which aid in the understanding or appreciation of the programs. Such materials, for example, might include maps, charts, statuary, pictures, and reference books for programs dealing with various social studies. The administration should provide also the best available receiving set and have the janitor-engineer trained to keep it in perfect condition. Furthermore, the superintendent, principals, and supervisors should hold conferences and provide demonstrations on the use of the radio and by other methods encourage teachers to learn to use the instrument effectively. Some school officials, in addition, place competent persons in charge of the school's broadcasting system and thereby supply local programs to supplement those available through commercial sources.

There are several essential preparatory steps which the classroom teacher must take before the reception period if his use of the radio is to be most effective. While developing his plans for the year's work he should study carefully the various sources of radio programs and draw therefrom all worth-while material which fits into his course, both as to time and as to content. During this process it will probably also be of value to leave gaps to be filled by important programs likely to be rendered upon short notice. Just before each unit is attacked, the teacher should revise that portion of his yearly plan and review the possibilities of supplementary content from radio programs. This final survey of radio material should be made with the aid of the pupils.

¹ An excellent manual of this type is the *Teacher's Manual and Classroom Guide*, prepared each year by Helen Johnson for the American School of the Air, Columbia Broadcasting System, New York.

Several days in advance of the program the teacher should begin definite preparation. All instructional supplies which may be needed during the broadcast should be prepared or assembled. A sheet of instructions should be mimeographed; with the aid of the pupils, pictures bearing upon the subject should be selected; maps or charts should be placed for convenient use; often an outline may be placed on the blackboard; and all other aspects of the setting should be arranged.

Certain psychological factors also require the teacher's attention. The pupils' interest should be stimulated. This may be done by having them participate in the preparation, by occasional reference to the program during class discussion, and by definite assignment of references given in the broadcast manual. If possible the sense of expectancy should be at a peak on the day the program is to be heard.¹ Another aspect of preparing the pupils to receive the broadcast is the training in listening and in note-taking. Practice exercises for both skills may be developed and used early in the school year to ensure increased ability of the pupil in learning from the radio.

Upon the day of the broadcast the set should be given a final inspection, the equipment be placed near the radio, and in ample time before the program begins the pupils should be assembled, with materials in hand, alert and eager for the program to start.

Reception

During the program the teacher guides the listening² of the class. He is an alert listener himself and is usually in charge of the receiving set to keep the tone clear and distinct, although a well-qualified pupil might be given that privilege. The pupil in charge should be taught to watch the others for signals when the sound fails to carry to some parts of the room. Permitting a pupil to take charge not only gives him a feeling of responsibility but also releases the teacher for supervisory activities. Pupils may take turns by programs in regulating the dials of the set.

It should be noted here that almost every teacher will really prefer to control the set himself during the program, for the same reason that most members of a small group listening to a world-series broadcast would prefer to be in charge of the dials. The teacher should give the pupils the

¹ Emerson D. Jarvis, "Teachers' Use of the Ohio School of the Air," *Education on the Air*, pp. 162-176. Ohio State University, 1932.

² Cline M. Koon, "The Technique of Teaching with Radio," *Elementary School Journal* (October, 1933), 34: 108-110.

opportunity to control the show from time to time if he wants them to understand that, after all, it is their show and not his.

Frequently the broadcaster will suggest that maps be referred to or that pictures or graphs be displayed to illustrate the point he is making. It is no longer the function of the teacher to carry out such instructions. The responsibility is the pupils', and they should be trained by the teacher to watch for such opportunities to be useful to the class. Before the program begins, it should be agreed that a certain pupil will be in charge of maps, another in charge of other visual aids, another prepared to perform an experiment if the program is to include one, a good writer ready to place outlines on the blackboard, and so forth, with as many pupils as possible actually participating to make the broadcast a success. All will miss a few notes while participating, but the action will very likely cause them to remember the points better than they would have remembered them from notes.

Note-taking is, however, an important part of the reception period. Each pupil should catch and jot down the essential points of all broadcasts that are not purely appreciation programs. Previous training will be necessary to make the note-taking bring the best results. After each broadcast, until the pupils have acquired the knack, some study of the process should be given, with illustrations from the notes taken during the program.

The practices of the schools of Germany during the reception period are of interest at this point :

Activity of Pupils and Teacher during a Broadcast. — The pupils should be seated in a semi-circle, near the loud-speaker. Each should be given two sheets of paper, one for noting words that they have not understood (the senior pupils adding a few remarks for future reference) and the other for jotting down the principal features of the talk. It will be found that children will at first experience considerable difficulty in taking notes; the teacher should therefore guide them by writing certain words and sentences on the blackboard, explaining after the broadcast why he did so. The very fact of being obliged to take notes compels a pupil to concentrate his mind on the subject. The broadcaster should also ask questions and invite the children to answer immediately. This is an excellent method of developing the pupils' mental activity. There is, however, a danger that it may, in some cases, lead to the repression of the other psychic faculties of the pupil by compelling him to take notes of what he has heard. The same drawback may arise with regard to maps, pictures, exhibited in the classroom. If adopted with discretion, these methods will always be effective although they may not always be indispensable; the essential point

to remember is that the talk should stimulate the children's imagination. The teacher, for his part, should summarise the most prominent features of the talk on the blackboard and then transcribe them in a book which will serve as an "aide mémoire" in the discussion that follows the broadcast. It will be seen, therefore, that these wireless lessons make greater calls on the activity of the teacher than an ordinary classroom lesson; he must intervene at every moment, keep his class on the alert, especially the pupils who are naturally inclined to adopt a passive attitude.

People who criticise school broadcasts on the ground that they encourage passivity sometimes confuse apparent activity with intellectual activity. The latter, when exercised in its highest and noblest form, takes place in silent meditation.¹

It is the teacher's function during the program to see that all the activities of the pupils are effective. It is not his function to perform the activities himself but rather to yield the floor to the learner. If his teaching is highly successful, in time he may need only to sit and enjoy the program that is presented by the broadcaster and the pupils.

Follow-up

The effective radio school broadcast stimulates learning. The nature of learning is such that it is likely to continue after it has become active. Interest, thoroughly aroused, carries on after its original stimulus ceases. The learning activities subsequent to the radio program obviously depend upon the interests aroused. A statement may be made which some pupil questions. He will be interested, preferably of his own accord, without a hypodermic from the teacher, in checking the statement against an accepted authority; and if the pupil's point is well taken, he may wish to write to the broadcaster for his viewpoint. Another pupil may wish to learn more of some person mentioned in the program and to do so may read all that the school library offers, and perhaps more if that does not satisfy him. Some broadcasts stimulate dramatic activities either during or after the broadcast.

Many teachers have pupils prepare booklets or outlines and engage in other similar activities to record the problem stimulated by the broadcast. These are desirable when not too artificially stimulated by the teacher's desires.

A good result of the broadcast is the interest which it stimulates in other radio programs. Frequently pupils take a new interest in the home

¹ *School Broadcasting*, pp. 108-109. League of Nations, International Institute of Intellectual Co-operation, 1933.

radio after having learned at school to listen intelligently; and, as stated previously, they may occasionally report such programs to their classes to supplement other sources of content.

The teacher should include radio content in reviews and in tests. It is as real a part of the course as textbook content and should be so considered by both teacher and pupil.

Numerous other follow-up activities will suggest themselves as soon as the school group begins to use the radio as a regular part of the instructional program. For example, any of the following might result from well-presented broadcasts: additional study of the music and biography of composers treated in broadcasts; map and geographical study of places where the news events have occurred; study of causes of various events reported and of subsequent results; dramatization of important historical or current affairs; performance of experiments suggested in the programs; practice of drill activities assigned by the broadcaster; and discussion of the program, with subsequent class activities.

The Radio and the Unit Plan of Instruction

The four stages of the unit plan described in Chapter IX are Introduction and Attack, Study and Work, Integration and Application, and Appraisal of Outcome. The radio has definite contributions to make to the unit plan, particularly to the first three stages. Thus the introduction-and-attack stage may be opened by a radio program bearing upon the unit. In the fields of history, geography, music, literature, current events, and vocational guidance the American School of the Air¹ each year schedules definite programs, many of which may be used during the first stage of a unit. For example, on December 3, 1934, the American School of the Air gave a program on *Columbus's Discovery of the New World* which would have been an excellent introduction to a unit on exploration. By the broadcast the pupils would have been stimulated to further study and prepared for their attack upon the unit. The classroom teacher, in initiating a unit, should consult the daily papers and select from the current radio programs any that promise assistance in his work. Some will be presented at hours not suited to the class hour, but individuals or groups may report the programs to the class. Obviously, no teacher should attempt to introduce each unit in this manner, but the broadcast will occasionally offer a very effective method of approach.

¹ Columbia Broadcasting System, New York.

Probably the best use of the radio can be made during the study-and-work stage. All the functions outlined in an earlier section of this chapter may be carried out during this stage with a general view to enrichment of content. The pupils should be free to study the schedules of broadcasts and, with some guidance at first, select the programs which bear most directly upon the unit. For the field of social problems there will invariably be news pertinent to the unit; for several subjects the well-planned work of the American School of the Air will frequently carry programs of outstanding value to units to which they apply; and occasionally a commercial program may be found of particular significance to the problem in hand. To these sources may be added whatever the state or local system is offering in broadcasts.

During the study-and-work stage the entire class may occasionally listen to a broadcast. In such cases ample preparation should have been made in the manner described above, several pupils should assist in making the reception a success, and various minor problems should ensue from the program and subsequently be followed up by individuals or by groups. More frequently, individual members of the class should be given the opportunity of hearing programs of special interest to the phase of the unit they are attacking and of reporting them to the entire group. Such programs may occur during school hours, and, if so, the pupil should be excused from other classes or activities to hear them; or they may occur in the evenings and be heard over home sets. In this manner the teacher will be able to use as content for his courses all relevant material that comes over the air during the study of each unit.

During the integration-and-application stage also several uses may be made of the radio. The study of a play may culminate in listening to a presentation of the play by radio artists. In similar manner music may be more thoroughly appreciated after having been studied. In the field of art well-integrated radio lectures may be heard after a certain period has been studied, and the broadcast may be treated either as the final integration of the unit activities or as suggestions to the pupil for preparing his own summary. Almost any radio address holds for the students of speech numerous illustrations of principles which they have studied and of techniques which they have practiced. Well-prepared talks on history, geography, literature, science, or in any other field give the pupil, in addition to new and vital information, certain generalizations which he may use frequently as the principles around which he may integrate his study of a unit. For example, the broadcast *London: Center of Commerce*

and Empire, presented October 24, 1934, by the American School of the Air, illustrated among other things the relationship of commerce and politics to geography.

Schools located in communities with local broadcasting stations have a different type of opportunity of value during the integration-and-application stage, that of occasionally presenting the results of the unit as a radio program. This may be done frequently in music, both vocal and instrumental. It is also practical in speech, debate, creative writing, and the drama. The extent of this opportunity depends upon the nature of the broadcasting station. If it is owned and operated by the local public-school system, it may be used often by pupils. The same would be true of stations operated by larger public educational organizations, such as the county or the state, and to a less degree of stations operated by colleges or universities. Some opportunities of this type are available through locally owned commercial stations, especially in the less cosmopolitan areas.

During the appraisal-of-outcome stage of the unit the chief value of the radio lies in the opportunities it offers the student to have his listeners evaluate the outcome of his work. Obviously, not many opportunities of this type will be offered unless the station is operated by the school, although a near equivalent is attained by some teachers by setting up an amplifier in the classroom and having the speaker or a group present a program from another room. Such a "station" is inexpensive and may be installed by any secondary-school boy interested in the problem. While the radio does not lend itself to a plan for exact measurement, the outcomes of many units in the fields enumerated above may be clearly defined and put to a test by use over the radio.

Creative Activity through Pupil Broadcasting

The foregoing discussion has dealt with reception within the classroom of programs broadcast by adults. Broadcasting by pupils has gradually developed in significance and has taken its place alongside reception of outside programs as a type of educational experience rich in possibilities. Pupil broadcasts are of three general types, each with numerous variations to fit pupil or local interest, or area of learning. The simplest type from the standpoint of equipment is the broadcast prepared within the classroom for use over a microphone in the classroom or near-by room. Such broadcasts are sometimes used rather effectively with no equipment,

the "microphone" being a make-believe instrument picked up at random in the room or shaped from materials in the woodcraft shop. A second type of pupil broadcast is used over the public-address system of the school. It may be sent from the pupils' own classroom or from an especially equipped studio within the school and tuned into any desired number of classrooms or into the loud-speakers of the auditorium or campus. The third type uses the facilities of a local commercial or educational station and may be sent over a wider area, including, if desired, any reception set within the school. These newer developments have several unique values. There are also values common to the two uses of the radio that are probably achieved more readily through pupil broadcasting than through reception of outside programs. Among these values are the following:

The development of initiative. For the pupil there is less chance for independent work and exercise of initiative in receiving a program prepared by outsiders than there is in preparing and presenting a program himself in co-operation with classmates and teacher. The teacher's task in the latter situation is gradually to make himself unnecessary, thereby giving the pupils increasing opportunity for the development of initiative. Making oneself unnecessary involves inhibiting the impulse to exercise one's own ego. That impulse is one of the greatest enemies of good teaching, the one which all too frequently brings to the teacher the satisfactions that should be the pupil's if his development rather than the teacher's is the primary purpose of the school.

Pupils who have been liberated gradually as they acquire the essential abilities of radio production will also acquire in increasing degree a sense of responsibility that will become a most powerful stimulus for the exercise of initiative. The high quality of the results will be surprising to many adults yet unaware of the latent powers of youth. Illustrations of excellent broadcasts by children are on the air almost daily. The Texas School of the Air science series by Denton, Texas, children,¹ the "March of Youth" programs of the Detroit public schools², and other programs in all parts of the United States, presented in the main by children of secondary-school age or younger, give ample evidence of the radio's power to stimulate initiative.

¹ *The Texas School of the Air*, Bulletin No. 405, pp. 76-108, State Department of Education, Austin, Texas, 1940-1941.

² Paul T. Rankin, "Education by Radio in the Detroit Schools," in Irvin Stewart's *Local Broadcasts to Schools*, Chapter II, p. 16. The University of Chicago Press, 1939.

The development of appreciation. Of considerable significance is the understanding and appreciation of radio broadcasting and broadcasts gained by pupils who themselves help give broadcasts. These pupils are helping develop a new form of literature. Such experience gives considerable insight into the skills required, the surprising amount of time and effort involved in preparing and presenting a good program, and the pressure under which work is done before a microphone. Of even greater importance is the power to appraise programs that results from such experience. This power or ability to discriminate is a phase of appreciation that will not only help the pupil to select the better programs for his own listening pleasure; it will also gradually tend to improve the quality of programs, because the commercial and other broadcasters will increasingly strive to satisfy the critical audience.

Learning by doing. The teacher should remember that classroom use of outside programs, particularly in the follow-up stage, provides for all children in a class many opportunities for learning through participation in worth-while activities. This value is not to be minimized. But it is obvious that preparing and presenting a program is an even greater stimulus to engage in worth-while experiences. Here the pupil has a hand in deriving the purposes of the broadcast, in searching for relevant and reliable material, in planning and preparing the script, in selecting the cast, in planning and preparing the sound effects, and eventually in presenting the broadcast. Every pupil in a class, each according to his interests and abilities, has the opportunity at various stages of the enterprise to be a very active participant. And the magic words "on the air" keenly motivate each to do his part thoroughly and accurately. Few school experiences equal the broadcasting activities in providing truly functional situations for the practice of language arts.

The thrill of creation. Every broadcast is a new creation, and every pupil who has a part in the production or presentation experiences the thrill that creative activity alone can bring. The developmental values derived from creative enterprise are gained in increasing degree as the production grows from its initial stages toward the climax of presentation. It is possible that enthusiasts of creativity make excessive claims for it in terms of the integration of personality, but observation of a radio-production group in action at various stages yields rather convincing evidence that at least some of the claims are valid. The pupil tends to forget self as his enthusiasm mounts: he is pursuing a well-defined purpose, he is an accepted member of a group and feels its unity in the

common effort, he has his suggestions accepted and watches them add significance to the production, he shares pride in a broadcast well received, and gradually he develops poise and confidence before the large audience of the air.

Co-operative action. The need for the ability to work in close co-operation is as great in broadcasting as in any other school enterprise. There is much give-and-take in developing the program, while in the presentation the need for precise and accurately-timed interaction is absolute if marked success is to be achieved. It is not claimed that from such experience in co-operation a generalized power will result that will cause a pupil invariably to co-operate in all situations. On the other hand, it is possibly true that the satisfactions derived from successful co-operative effort in radio production yield attitudes and skills that function in subsequent co-operative enterprises.

Keen motivation for perfection. In listening to a broadcast, the pupil learns from observation the need for accuracy in all aspects of speech, for reliability in all statements used as facts, and for preciseness in organization and timing. The program that attains near-perfection impresses him as a listener, and minor errors are magnified when heard or otherwise sensed over the radio. When the pupil becomes a participant, this need for perfection is brought home to him even more keenly. He is now the participant whose acts are being observed by others. To win favorable recognition he must approach the perfection he has formerly observed as a listener.

Outlet for classroom and laboratory work. The prospect of presenting a radio broadcast will stimulate a class in any field of learning. Local or near-by commercial radio stations usually are willing to co-operate by giving time each week for school broadcasts. Also, the public-address system of the school may be used. An outlet is thereby provided for pupils to present suitable results of their classroom or laboratory work to a larger audience than their own group. The production of a real or simulated radio program is especially suitable as a culminating activity for a learning unit. While the practice is more applicable to language arts, music, social studies, and the sciences, it may also be used successfully in dramatizing the significance of mathematics, foreign languages, or other fields.

Outlet for special talent. While care should be taken not to exploit children of marked musical or other artistic talent by too frequent appearance, the radio has brought such pupils an exciting opportunity for the

development of their unusual abilities. It should not be assumed that the genius or near-genius alone is being considered at this point. The writer is indebted to Tracy Tyler for an illustration of an over-age girl, a misfit in her group because of her peculiar voice as well as because of her age, who stole the show when as a last resort the group assigned her the part of an old woman in a skit. Her marked success caused her for the first time to be accepted as a real member of her class group. The idea applies to all children who, because of native endowment, special interest, or even a disability, may have unusual talent of some kind. Successful exhibition of that talent, within reasonable bounds, will do much to facilitate the normal growth of the individual. With this end in mind, the teacher may use the radio to provide the outlet.

Practice in service to school and community. Not the least value of pupil broadcasting in a time when good citizenship is being emphasized as a major aim of education is the experience the pupil gains in programs designed to improve the school and community. The purpose of the pupil-prepared program may be to build a better *esprit de corps* in the student body, or to promote safety, or to help improve school sanitation, or to orient newcomers. Or the program may seek to improve community conditions by sponsoring the community-chest campaign, or by emphasizing traffic or health regulations, or by helping promote beautification projects. Programs of this type, whatever the specific aim, give the participant new opportunities to cultivate civic consciousness and to acquire some of the attitudes and abilities basic to good citizenship.

Pre-vocational training. A minor value achieved from pupil broadcasting is the pre-vocational experience it yields those who may later enter some branch of radio as an occupation. Because the importance of this outcome is sometimes overestimated, it is mentioned at this point as a warning rather than a recommendation. Whereas in the earlier days of the radio numerous persons without prior training entered the field, today competition is so keen for positions that most new employees are being selected from applicants with college degrees in speech, dramatics, or specialized branches of engineering. The tendency to overestimate the vocational value of such experience may be due in part to exaggerated claims of some commercial announcements worded to entice the gullible to take their courses and immediately become successful announcers or other radio workers. In any event, it should be borne in mind that, except in rare cases, pupil broadcasting does not prepare the pupils for jobs upon leaving high school. At most, from the standpoint of vocational

training, broadcasting by pupils is only an exploratory experience. Its vocational value should not be overestimated.

The purposes of the broadcasts presented by the Detroit public schools illustrate the ends sought through this use of the radio in a large city. Rankin states them as follows:

In brief, then, the public-school radio programs in Detroit are directed toward the attainment of four general objectives: (1) to interpret the schools to the community by means of radio; (2) to supplement other forms of classroom instruction by the use of radio; (3) to provide selected pupils with learning experiences in broadcasting radio programs; and (4) to develop in all pupils better taste and discrimination in radio listening.¹

The values of pupil broadcasting outlined above should supplement rather than supersede those enumerated earlier under classroom reception. Each of the two types of use of the radio has its unique advantages, and the two types have advantages in common not offered by other school procedures. Therefore the radio is firmly established in the modern school. It is an aid of such value to education that the work of every teacher would be greatly enhanced by its use.²

Difficulties That Are Being Overcome

The late thirties and early forties saw rapid progress toward overcoming some of the difficulties that had previously confronted the successful use of the radio as an educational aid. At some points progress has resulted from co-operation between leaders in radio and leaders in education, at others it has come from technological improvements, and at still other points it has followed the advancing theory in curriculum and instruction which has tended to permit greater flexibility to fit individual interests and needs. Several lines of improvement that have come from one or more of these three basic causes may be noted.

Greater opportunity for teachers to learn how to use the radio. According to Power and Barker,³ 521 colleges and universities in the United States were offering courses in radio in 1941, which is doubtless a marked increase over the number of institutions offering radio five years earlier, although

¹ Paul T. Rankin, "Education by Radio in the Detroit Schools," in Irvin Stewart's *Local Broadcasts to Schools*, Chapter II, p. 15. The University of Chicago Press, 1939.

² Dr. Alvin L. Chapman, University of Texas, and Dr. Tracy F. Tyler, University of Minnesota, read this section and contributed valuable suggestions.

³ Leonard Power and Amelia O. Barker, *College Radio Courses*. Federal Radio Education Committee, United States Office of Education, Washington, D.C. Mimeographed for free distribution, August 1, 1941.

comparable figures are not cited by the authors. The types of courses are also expanding. In the list prepared by Powers and Barker, about one half of the institutions offer more than one type of course in radio and some offer as many as eight types. Several of the types available in 1941, in addition to a general course, included courses in program planning and production, education by radio, script-writing, radio announcing, news-broadcasting, and radio dramatics and speech. Summer workshops in radio for teachers are offered in a number of institutions.

Thus it is possible for any teacher or prospective teacher, either in summer or in regular sessions, to pursue courses in the field of radio education. However, until teachers have availed themselves of these opportunities to a larger extent than they have in the past, their work will not receive the full benefits that are to be had through the use of the radio.

More and better equipment. It has become standard practice in erecting new school buildings to wire for classroom and other reception and, if funds are available, to install complete public-address systems. Also, in recent years hundreds of partial or complete systems have been installed in old buildings. These improvements have eliminated such former inconveniences as moving small radio sets from room to room, or moving classes to a single room designated as the radio room, or holding too frequent assemblies to use the auditorium reception set.

Furthermore, while the number of public-address systems in schools has been increasing, the quality of the equipment has been improving and the price has been decreasing. Thus the problem of adequate equipment is being solved in an increasing number of schools. Although it is true that many schools are still not well equipped for the use of radio, teachers everywhere are much less handicapped by poor equipment than formerly, and they are being encouraged by school officials to use the equipment now available and to assist in improving it.

More educational directors in broadcasting stations. A severe handicap to the proper use of the radio by schools before the late thirties was the shortage of broadcasters with a knowledge of educational theory and practice. A definite improvement has occurred in this regard. Every station of any size has designated one of its staff as educational director, and smaller stations are usually conscious of this need when selecting personnel. Whereas in the earlier day few stations had an understanding of teaching problems involved in broadcasting to schools, now the schools receive materials over the air that have been prepared under the guidance of educational workers.

Furthermore the schools receive upon request much guidance in the preparation of school broadcasts and the willing co-operation of local managers in broadcasting by pupils over commercial stations. The lack of sympathy which formerly resulted from the lack of understanding of instructional problems and of the significance of public education has changed to an attitude of willingness to help achieve the general objectives of the school.

A more flexible organization of the instructional program. The idea of verbatim learning from textbooks or rigidly fixed courses of study is passing from an ever-increasing number of school systems. Research¹ has shown that flexibility, which permits greater treatment of present-day problems, stresses pupil adjustment as the basis for learning, emphasizes co-operative planning by teacher and pupils, gradually substitutes purpose for imposed learning, and uses democratic methods of instruction, facilitates subject-matter achievement better than the traditional practices and, in addition, results in better work habits and attitudes toward learning. This advancement in educational theory has removed one of the chief difficulties that until recent years largely frustrated proper use of the radio in the schools.

Now that many schools have freed themselves from the shackles of the textbook teaching and petty course-of-study regulations, teachers and pupils are at liberty to exert their initiative in supplementing or altering their plans of work. Radio guides are studied by teachers and pupils, and significant programs relevant to their problems are tuned in for as many groups as possible at the time they first come over the air. The radio guide has thus become an important source for learning materials. Classes have radio committees to keep constant check on important programs.

Many teachers have several sections of the same class. Frequently, but not always, the sections have common problems which call for the same broadcast at different hours. To meet this difficulty many schools make recordings of the programs, provided they may be recorded. Most programs of significant value to the schools have no restrictions against recording for use in the classroom, and the expense is small.² Consequently, one or more groups may hear the original broadcast and the others may hear the transcription. Research has shown "that there is

¹ Burton P. Fowler, "An Appraisal of the Eight-Year Study of the Progressive Education Association," *The Educational Record* (Supplement No. 14, January, 1941), 22: 106-121.

² In 1942 the cost for transcribing a thirty-minute program ranged from \$1.50 to \$2.

no significant difference in children's interest or in educational effectiveness" ¹ between the use of recordings and the use of the radio for a given program.

An additional use of transcriptions should be stressed. It is their use for review or for immediate or subsequent repetition. Whereas formerly it was necessary to limit the reception to one rendition, often held under unfavorable conditions, now it is possible to repeat the broadcast as many times as may seem desirable through use of the record upon which it has been transcribed. Such records may also be kept for future use with other classes.

The more flexible arrangement of the school's program makes possible still another practice not formerly used to any extent under the traditional pattern of the curriculum. It permits much out-of-school listening and classroom reporting on important evening or night programs. At present it is not at all difficult in most schools for a teacher and pupils to cover all after-school broadcasts and to select those of significance to the work of the class. In some schools, group meetings in the home of the teacher or some pupil are arranged occasionally for this purpose.

Increasing amount of educational material on the air. National, regional, state, and local agencies have in recent years either established or improved their schools of the air.² Some of the schools of the air are public services of the large commercial chains.³ Others are conducted by local or state educational systems. Reference has been made to the broadcasts by the Detroit public schools and the Rochester public schools.⁴ Cleveland, New York City, and other large cities have also done outstanding work in this field.

Some of the state schools of the air have been co-operative undertakings of the state departments of education and the higher educational institutions. Particularly outstanding have been the Wisconsin School of the Air, the Ohio School of the Air, and, more recently, the Texas School of the Air.

¹ J. Wayne Wrightstone, *Live Broadcasts versus Transcriptions in the Learning Process*. The Evaluation of School Broadcasts, The Ohio State University, 1941. 10 pages.

² Leonard Power (chairman) and others. *Radio in Education. A Syllabus for a College Course on Radio for Teachers, Supervisors, and School Administrators*. The Federal Radio Education Committee (with the co-operation of the United States Office of Education and the Federal Security Agency). Washington, D.C., 1941.

³ See *School of the Air of the Americas — Teacher's Manual, 1941-1942*, Columbia Broadcasting System, New York. (Free. Published annually.)

⁴ Irvin Stewart. *Local Broadcasts to Schools*. The University of Chicago Press, 1939.

These four types of schools of the air are seeking constantly to improve their broadcasts to schools, and together reach almost all parts of the country. Increasing attention is also being given to interchange of broadcasts with nations of Central and South America, an excellent illustration of which is The School of the Air of the Americas, designed by the Columbia Broadcasting System for use in all nations of the Americas.

The educational materials on the air are not limited to the schools of the air. The schools of the air represent an organized and well-planned effort to supplement the educational experiences of children and youth in school, but many outstanding programs come from other sources. The Federal Office of Education has done much to stimulate the use of radio through its broadcasts, its radio scripts, and its recordings, particularly "Americans All — Immigrants All," and through the columns of its official journal.¹ Several large manufacturers vie with each other in presenting musical and other broadcasts that are largely educational in nature. The national and the regional broadcasting chains have the established policy of carrying many educational programs, in addition to their schools of the air. Such programs touch almost every area of life, past and present, and therefore enrich every area of learning in the schools.

Thus it may be seen that many agencies are co-operating, and that others are competing, to enrich the experiences of school children by affording them the best programs that can be created.² Few schools in America are outside the radii of broadcasts for schools. Many have a very wide range of programs from which to choose.

Research in Education by Radio

In 1933 twenty-five nations reported to the International Institute of Intellectual Co-operation³ their experiences in the use of radio for educational purposes. Only six of the twenty-five reported researches to discover the value of the radio instruction. Many of the studies were surveys of opinion of teachers and pupils rather than experimental studies to determine the relative value of the radio and other methods of in-

¹ *School Life*. U.S. Office of Education, Washington, D.C. (One dollar per year.)

² In 1940, A. L. Chapman, Director of the Bureau of Research in Education by Radio, University of Texas, listed forty-seven radio manuals for teachers from commercial and educational agencies, then on file in the Joseph L. Henderson Textbook Collections at that institution.

³ *School Broadcasting*, pp. 52-202. League of Nations, International Institute of Intellectual Co-operation, 1933.

struction. Germany¹ reported that, as the result of "official enquiries" and organized conferences with local education officials:

On the whole, it may be stated that school broadcasting has definitely established itself in German schools. The place which it occupies in the school programmes will become still more important as the educational value of these broadcasts increases.

The results of the Kent experiment in England, a survey of opinion, were reported as follows:

The general opinion held by primary school teachers was that these talks developed their pupils' knowledge, awakened their interest, left an impression as lasting as that made by ordinary classroom work, did not encourage inattention, were particularly evocative for the more advanced pupils, and furnished surveys on subjects and items of information which the teachers were not always in a position to give; further, they suggested to the teachers new ideas for their own class work. It was generally recognised that these lessons could not usefully be taken by children under 11 years of age. With regard to secondary schools, attention was called to the difficulty experienced in fitting these talks in with the normal school time-table and curriculum.²

Almost every nation reported rapid increase in the number of schools using the radio, although such difficulties as poor reception, articulating the radio programs with the curriculum and school "time-table," and inexperience of teachers and broadcasters were commonly revealed in survey inquiries conducted by the various nations.

More research of a critical nature on the problem of radio education has been conducted in the United States than in other nations. In 1932 Charters³ outlined needed research in thirteen aspects of radio education: objectives, administration of the station, curriculum materials, methods of presentation, methods to be used in classroom reception, pupils and their learning, adult audiences and their learning, equipment, measurement, psychology, bibliography, history of radio education, and comparative radio education. Subsequently Charters in 1933⁴ and Lumley in 1934⁵ reported the research that had been conducted in the thirteen

¹ *School Broadcasting*, p. 111.

² *Ibid.* p. 132.

³ W. W. Charters, *Research Problems in Radio Education*, pp. 17-31. (Information Series No. 4.) National Advisory Council on Radio in Education, New York, 1932.

⁴ W. W. Charters, "Trends in Research," *Education on the Air* (Fourth Yearbook of the Institute for Education by Radio, edited by Josephine MacLatchy), pp. 299-313. Ohio State University, 1933.

⁵ Frederick H. Lumley, "Trends in Research," *Education on the Air* (Fifth Yearbook of the Institute for Education by Radio, edited by Josephine H. MacLatchy), pp. 281-292. Ohio State University, 1934.

areas of education by radio. Seventy-nine studies were reported in 1933 and seventy-four in 1934.

Although it is not possible in the present volume to relate in any detail the findings of these and numerous other studies in the field of radio education, some of the outcomes may be mentioned. At the outset, however, one point should be made quite clear. The radio is a relatively new invention and its use in the classroom still very much of a novelty. Therefore one cannot yet be certain whether the stimulation and interest and the consequent learning and retention are attributable to the newness of the device or to more basic elements which will endure after the newness has worn off. In this connection it should also be remembered that teachers have not yet become skillful in using the radio and that pupils have not been adequately trained to listen to radio presentations. These two conditions operate to reduce the effectiveness of the radio as a teaching and learning device.

Numerous survey studies in America and abroad have quite definitely shown that teachers have found the use of the radio highly satisfactory and that pupils respond favorably to radio instruction. When questioned whether the school broadcasts should be continued or discontinued, teachers strongly prefer that they be continued. In support of their reactions they cite the values of the radio instruction enumerated earlier in this chapter. In like manner a large majority of pupils enjoy listening to the broadcasts and enter with enthusiasm the contests which in some countries have been used to test the radio's usefulness as an instructional device.

Critical research of the radio's effectiveness as an aid to teaching has been limited. Most of the findings, however, are favorable to radio instruction. For example, Lumley¹ clearly demonstrated the radio to be highly effective as an aid in teaching a foreign language and in teaching English. Empirical evidence of its value in foreign language was reported to the International Institute of Intellectual Co-operation by representatives of Sweden and Switzerland.² In Rochester, New York, measured results showed the radio to be valuable in the teaching of arithmetic, science, and literature.³ The radio's effectiveness in news-broadcasting

¹ Frederick H. Lumley, "Does Radio Broadcasting Help Pupils Pronounce a Foreign Language?" *Modern Language Journal* (March, 1934), 6: 383-388, and "The English Teacher and Radio Broadcasts," *English Journal* (June, 1934), 22: 478-485.

² *School Broadcasting*, pp. 167, 171, respectively.

³ *Education on the Air* (Fifth Yearbook of the Institute for Education by Radio), pp. 313-318.

to schools was reported by Meyer,¹ of Oakland, California. Earlier work at Oakland had proved the value of the radio in teaching English, geography, literature, history, arithmetic, and penmanship.² Likewise, the Cleveland, Ohio, public schools have had marked success in teaching arithmetic by radio and have begun a similar program in the field of social science.³ In a series of controlled classroom experiments in thirteen Texas high schools on the use of the radio to stimulate reading, Chapman and others found that the groups that listened to "Reading is Adventure"⁴ subsequently read more good books than the control groups and acquired more new interests.⁵

Several research agencies are constantly improving devices for evaluating broadcasts to schools, notably The Evaluation of School Broadcasts of The Ohio State University⁶ and the Bureau of Research in Education by Radio of The University of Texas.⁷ The publications of these bureaus provide instruments by which teachers may appraise the broadcasts received in their classrooms⁸ and by which teachers and administrators may appraise their systems of broadcasting.⁹ It should be noted that the preparation of such instruments is not only a highly valuable type of research within itself but also the foundation for subsequent evaluative research by teachers and administrators. A somewhat different type of research agency that is making valuable contributions to radio education is the Committee on Scientific Aids to Learning of the National Research Council. While this committee is primarily interested in basic scientific research related to learning aids, one of its publications reports a survey of local broadcasting systems which is of considerable value to schools near broadcasting stations.¹⁰ The volume reports the purposes

¹ *Education on the Air* (Fifth Yearbook of the Institute for Education by Radio), pp. 86-95.

² *Ibid.* p. 86.

³ *Ibid.* pp. 177-178.

⁴ *The Texas School of the Air, Teachers' Manual and Classroom Guide*, pp. 109-124. State Department of Education, Austin, Texas.

⁵ A. L. Chapman, "The Classroom Use of Radio to Stimulate Reading," in Hob Gray and David Votaw, Jr., *Classroom Instruction*, Bulletin No. 4042, University of Texas, Austin, November 8, 1940.

⁶ I. Keith Tyler, director.

⁷ A. L. Chapman, director.

⁸ Seerley Reid and Norman Woelfel, *How to Judge a School Broadcast*. The Evaluation of School Broadcasts, The Ohio State University, Columbus, 1941.

⁹ A. L. Chapman, *A Form for the Evaluation of a System of School Broadcasting*. (Prepared in co-operation with the Evaluation of School Broadcasts Project, The Ohio State University.) Bureau of Research in Education by Radio, The University of Texas, Austin, 1939.

¹⁰ Irvin Stewart, *op. cit.*

and practices of broadcasting by the public schools of Alameda (California), Akron, Cleveland, Detroit, Portland (Oregon), and Rochester.

The foregoing survey of research in teaching by radio is in no sense complete. Numerous other cities have had experiences similar to those cited; several states, particularly North Carolina, Ohio, Texas, and Wisconsin, have successfully demonstrated the value of state-wide broadcasts to schools; approximately thirty higher educational institutions have their own stations, while almost all have agreements with local commercial stations for their use in various types of educational broadcasting; marked success has accompanied the efforts of the school of the air of the Columbia Broadcasting System, the public-service educational features of the National Broadcasting Company, particularly the Damrosch hour, and comparable work of regional chains; and various educational programs of industrial establishments have withstood the tests of research. Each of these agencies has conducted survey researches, and some have measured the effectiveness of the radio by experimental studies. The positive evidence yielded by these investigations has been sufficiently strong to demonstrate clearly the value of the radio as an aid to the classroom teacher. Its instructional value had been so definitely proved that after Pearl Harbor the radio rapidly became one of the most powerful instruments used by our government officials and numerous lay groups to instruct the people on all vital wartime problems.

Radio Material for Classroom Use

It was stated above that educational broadcasting has not been sufficiently developed to serve all the functions that might be realized from the radio as an aid in classroom instruction. Until teachers become highly skilled in the use of the radio and until pupils become accustomed to learning by radio, it would no doubt be wasteful to supply educational material over the air greatly in excess of that which is now available. An increase in educational broadcasting is certain to follow the increased ability of teachers and pupils to use the materials with profit.

Although school broadcasting is in its developmental stages, for several years there have been ample opportunities for teachers to enrich their teaching materially by use of the radio, though not adequately as judged by eventual probabilities. In the preceding discussion, for illustrative

purposes, occasional reference has been made to some of the opportunities. The purpose of this final section is to discuss in some detail the various types of radio material available for school use.

The two most valuable series of national school broadcasts have been conducted as the American School of the Air and the Damrosch Music Hour. From October 22, 1934, to May 10, 1935, the American School of the Air broadcast for a half-hour during each school day. Eighty-seven stations were in the chain, reaching every section of the United States. Literature, history, geography, music, library, current events, and vocational guidance were included in the programs. An elaborate *Teacher's Manual and Classroom Guide* was prepared and distributed without charge. In similar manner the Damrosch Music Hour has offered instructions to teachers to facilitate learning and appreciation during the broadcasts. These two major offerings to the schools have continued to grow since their establishment and will unquestionably be used by an increasing number of schools.

Numerous programs are available for school use over stations operated or leased by colleges and universities and over state-owned stations. More than sixty higher educational institutions operate their own stations, and more than forty others have contracts with commercial stations. At least nine states operate broadcasting stations, largely for educational purposes. Much of the content broadcast by these hundred or more stations is designed for adults, but all the broadcasts contain content which would enrich one or more secondary-school fields. Many of the programs are especially designed for grade and secondary-school pupils. Teachers may secure complete information concerning such radio facilities in their own states by inquiring of their local or state school officials.

The entertainment programs of many commercial stations frequently contain much of real educational value. This is particularly true of the drama and music. Almost every station has news flashes which over the period of a school year will contribute to practically every secondary-school field. The fact that such programs are usually broadcast outside of school hours does not lessen their value. Pupils will eagerly watch the program schedules in the daily papers, if properly motivated, and will report what they have heard over their home sets.

Various national organizations and institutions promote series of programs of value to secondary-school pupils. For example, one year the American Museum of Natural History broadcast a series of twenty-one lectures of great significance to students of natural science. The National

Advisory Council on Radio in Education¹ has conducted a Listen and Learn Series of educational broadcasts. The listener's handbook which has been supplied by the council free has facilitated the pupil's progress. These series have included such problems as "The Economic World Today" and "You and Your Government." The council has rendered other valuable services to educational broadcasting by advising with the two main broadcasting systems, by publishing an Information Series, by conducting conferences, and by continually studying the problems of radio education.

Two other important agencies for the advancement of radio education, although neither sponsors broadcasts, should be mentioned. One of them, the National Committee on Education by Radio, resulted from a conference called by the United States Commissioner of Education in 1930. The purpose of the committee is as follows :

The purpose of the Committee shall be to secure to the people of the United States the use of radio for educational purposes by protecting the rights of educational broadcasting, by promoting and co-ordinating experiments in the use of radio in school and adult education, by maintaining a service bureau to assist educational stations in securing licenses and in other technical procedures, by exchange of information through publications, and by serving as a clearing house for the encouragement of research in education by radio.²

The committee encourages legislation favorable to educational broadcasting, keeps up a library of material on educational broadcasting, reports findings of research in radio education, supplies educational material to stations, publishes and distributes free a periodical bulletin, entitled *Education by Radio*, that is of value to teachers and administrators, and in general attempts to promote the cause of radio education in the United States.

The other agency to be mentioned is the United States Office of Education, which, through its senior specialist in radio and visual education, prepares bulletins on radio education, supplies numerous articles on the subject for educational journals and addresses for educational conferences, prepares bibliographies of researches and articles, and in the columns of its official monthly magazine³ offers suggestions to teachers.

The foregoing treatment of the available radio material for classroom

¹ 60 East Forty-second Street, New York.

² *History, By-Laws, Objectives, a Proposal, Achievements*, p. 3. National Committee on Education by Radio, Washington, D.C., 1935.

³ *School Life*. United States Government Printing Office.

use is not intended to be complete. The sources cited have been illustrative and suggestive. Obviously programs change from year to year. Enough has been presented to make it quite clear that there is now available sufficient educational material on the air for every teacher to make some use of the radio in his teaching. And one may be certain that new sources will be added continually as the agencies now promoting radio education increase in strength and prestige. School officials or teachers should feel free to write to the program directors of any station from which they might receive programs, to the various radio organizations, and to the United States Office of Education for advance notice of programs and for further suggestions on the use of the radio in the schools.

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CHAPTER XIV · Principles and Instruments of Measurement

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Purpose of the Chapter

It is no longer possible for a teacher to achieve his greatest professional growth without an understanding of at least the simpler processes by which the results of teaching may be measured. Since the beginning of the twentieth century education has developed a scientific foundation which rests upon the less complex of the mathematical processes of exact science. With the mathematical processes have come several terms now frequently encountered in almost all educational literature. It is important that every teacher understand and appreciate the significance of these terms. Perhaps it is even more important that the teacher be able to use the processes in his own teaching. By using them he will be able to measure the effectiveness of his work and to express the results in the accepted technical and scientific terms.

The instruments and processes of measurement in education consist of

objective tests of various types, of measures which correspond to the weights and measures of the physical sciences, and of standardized methods for interpreting and using the results obtained from the measurement of classroom work. It is the purpose of this chapter to introduce the prospective teacher to the elements of educational measurement. Only parts which require a minimum of mathematical ability have been selected.

Nature and Function of Measurement

In the field of education measurement is the process by which the capacities of pupils and changes in those capacities are evaluated in terms of amounts. The capacities may be in ability to multiply, to spell, to write compositions, to appreciate poetry, to understand what is read, to apply scientific principles, or any one of the numerous other capacities which are developed by the program of the school. For example, on a given date a teacher wishes to know the amount of John's ability to write a composition on a given topic. He determines that ability in terms of a numerical score by comparing John's composition with those on a scale which carries previously assigned numerical values. Six months later he wishes to know how much John has changed in his ability to write compositions. He again compares John's product with "scaled" compositions and learns that John has improved two points of a possible eight. From this illustration it is clearly evident that the crux of the problem of measurement in education is the yardstick by which a capacity can be numerically evaluated.

The problem of standardizing the instruments of measurement has been of primary importance in the development of civilization. Progress has always depended upon the general acceptance of fundamental units of length, mass, and time. More than four thousand years ago the Chaldeans solved the problem in a practical manner by using the human forearm as their unit of length, the cubit; by using the weight of a cube of water two thirds of a cubit (a foot) on each side as their unit of mass, the talent; and by using the equinoctial day as their unit of time. They divided the unit of time into day and night of twelve hours each, and each hour into sixty minutes. More than forty centuries later the English and French nations repeated the process in such a similar manner that, according to Harkness,

without much exaggeration we may regard the present English and French fundamental units of length and mass as representing, respectively, the com-

mercial and the royal units of length and mass of the Chaldeans of four thousand years ago.¹

As science advances, new measures must be developed and greater accuracy obtained. For example, with the discovery, production, and use of electricity came the necessity of measuring resistance, current, quantity, and power. To meet this need, in 1893 the Chamber of Delegates of the International Electrical Congress defined and recommended the ohm, ampere, coulomb, and watt. Until the eighteenth century the quadrant was used for observations upon the sun to check time measurements, and a reading which checked with an error of not more than three seconds was considered satisfactory; but the transit instrument was invented early in the eighteenth century and met the demands of science by reducing the error to less than one second. Now the error is in terms of hundredths of a second. Similarly refinements have occurred in measurements of length and mass by use of micrometer microscopes and other devices until the results approach absolute accuracy. More than a century ago Lenoir, by use of the lever comparator, was able to measure lengths "regarded as trustworthy to 0.000077 of an inch."²

Measurement has the same function to perform in education that it performs in other branches of science. That function is to evaluate in numerical terms according to standard units, to record observations quantitatively in a manner which will make the records comprehensible to all scientists in the given field. Although education is a relatively young science, many of its measuring units have been refined to a fairly high degree of trueness and accuracy. No claim can yet be made that education is an exact science, but by virtue of its instruments of measurement it is making rapid progress in that direction.

Types of Measurement in Education

During the second half of the nineteenth century several eminent scholars, including Galton in England and Cattell in America, laid the foundation for the science of education.³ The challenge to measure the results of teaching was flung by Rice⁴ in 1894 but went unheeded by

¹ William Harkness, "The Progress of Science as Exemplified in the Art of Weighing and Measuring," Smithsonian Report, 1888, pp. 597-619. United States Government Printing Office, 1890.

² Ibid. p. 609.

³ C. W. Odell, *Educational Measurement in High School*. D. Appleton-Century Company, Inc., 1930.

⁴ J. M. Rice, "The Futility of the Spelling Grind," *Forum* (April-June, 1897), 23: 163-172, 409-419.

the antagonized schoolmasters of his day. Education accepted the challenge soon after the turn of the century, however, and began serious experimental work in several of its major fields. The types of educational measurements may be roughly classified according to the various fields involved. Only one field, that of the measurement of achievement, may be more than introduced in the present volume. The others will be mentioned and references given for students who may wish to pursue them further.

Intelligence

The experimental work of Thorndike¹ in America, Spearman² in England, Binet in France, and his American translators³ upon the nature and measurement of intelligence has given education a solid scientific basis upon which to build. Their studies, begun soon after 1900, have resulted not only in well-established theory but also in measuring instruments of practical value to the public schools. The intelligence tests provide a fairly accurate measure of the intelligence of each pupil, thus giving the teacher a start toward adjusting his instruction to the various abilities found in each class.

Special Aptitudes

Hull refers to Plato's suggestion of "having 'each man work at a single occupation in accordance with his natural gifts'"⁴ and of devising actions for each individual to perform to determine which occupation he could pursue most successfully. The measurement of special aptitudes has made little progress toward Plato's ideal and has less to offer the classroom teacher than is offered by intelligence-testing. There has been some progress, however, particularly in art,⁵ music,⁶ and mechanical

¹ Edward L. Thorndike, *An Introduction to the Theory of Mental and Social Measurements*. Bureau of Publications, Teachers College, Columbia University, 1904. (Revised, 1913.) See also, by the same author, *The Measurement of Intelligence*. Bureau of Publications, Teachers College, Columbia University, 1927.

² C. Spearman, *The Nature of "Intelligence" and the Principles of Cognition*. 1923. By permission of The Macmillan Company, publishers. See also, by the same author, *The Abilities of Man, Their Nature and Measurement*. The Macmillan Company, 1927.

³ L. M. Terman and others, *The Stanford Revision and Extension of the Simon-Binet Scale for Measuring Intelligence*. Warwick and York, 1917.

⁴ From Clark L. Hull, *Aptitude Testing*, p. 6. Copyright, 1928, by World Book Company, Yonkers-on-Hudson, New York.

⁵ Norman C. Meier, *A Measure of Art Talent*, University of Iowa Studies in Psychology No. XVIII.

⁶ Carl Emil Seashore, *The Psychology of Musical Talent*. Silver, Burdett and Company, 1919.

ability,¹ the results of which give the teacher some assistance in guiding his pupils according to their promise or lack of promise in these three fields.

Attitudes

Scientific work in the field of measuring attitudes gives promise of becoming highly significant to the classroom teacher. Measuring devices have been developed by Thurstone,² Remmers,³ and others which may be used, subject to the limitations imposed by the copyright act, by the research departments of public schools. Information about the attitudes of students, obtained from such departments or by teachers themselves after they have become adequately trained, may become of vital significance to the teacher as he plans his instruction to meet the needs of his individual students. Thus unfavorable attitudes in matters of race, nationality, and religion that lead to friction may be modified, whereas desirable attitudes toward civic responsibilities, moral principles, and other aspects of social life may be built up. Definite classroom procedure to weaken or remove undesirable attitudes and to foster and establish desirable attitudes is becoming an increasingly important phase of the teacher's work. Scientific instruments for measuring attitudes enable the teacher to determine the amount of his progress in changing pupils' attitudes.

Personality and Character

The highly intangible fields of personality and character have been vigorously attacked by numerous scientists with a view to the definition and measurement of traits. A summary⁴ of the research in this field outlines the work with more than forty traits of character or personality, examples of which are honesty, confidence, accuracy, aggressiveness, humor, leadership, perseveration, and suggestibility. Most of the work has been done since 1920. The results have not been greatly beneficial to the classroom teacher. It remains to be seen whether or not measurement in this important field will become sufficiently true and accurate to be used with confidence by classroom teachers.

¹ Clark L. Hull, op. cit. John L. Stenquist, *Measurements of Mechanical Ability*, Contributions to Education No. 130. Teachers College, Columbia University, 1923. See also Donald G. Paterson and others, *Minnesota Mechanical-Ability Tests*. The University of Minnesota Press, 1930.

² L. L. Thurstone and E. J. Chave, *The Measurement of Attitude*. The University of Chicago Press, 1929.

³ H. H. Remmers, "Studies in Attitudes," *Bulletin* (December, 1934), Vol. 35, No. 4. (Studies in Higher Education.) Purdue University.

⁴ Harry J. Baker, "Tests of Personality and Character," *Review of Educational Research* (June, 1932), Vol. 2, No. 3. American Educational Research Association.

Appreciation

It is gradually becoming apparent that some aspects of appreciation can be measured. Speer¹ in 1929 devised a scale which measured pupils' ability to recognize differences between good and bad poetry, and used previously built prose scales for a similar purpose. More recently Carroll² has developed prose-appreciation tests for secondary-school students which definitely aid teachers in measuring pupil improvement in the appreciation of prose. Similar progress has been made in art by Meier and Seashore³ and by McAdory.⁴ Tests for the appreciation of music have been prepared by Hevner⁵ and Landsbury.

The student of education may expect further development in the measurement of appreciation. Although until recent years appreciation has been considered too intangible to measure, the pioneer work of the investigators just mentioned has demonstrated that it can be measured; and their work has placed in the hands of teachers the instruments with which to measure appreciation of literature, art, and music.⁶

Subject-Matter Achievement

Great progress has been made in the measurement of subject-matter achievement since Rice constructed his spelling tests in the middle nineties. This type of educational measurement has produced more results which are of immediate practical value to the classroom teacher than any of the other types briefly outlined above, and is therefore treated in some detail in the remainder of this chapter.

Nonfactual Outcomes of Learning

Before proceeding with the detailed treatment of subject-matter tests attention is called to an important innovation in the field of the measurement of educational outcomes. The rebellion against formalized procedures in schools has been directed toward the examination and marking

¹ Robert K. Speer, *Measurement of Appreciation in Poetry, Prose, and Art, and Studies in Appreciation*, Contributions to Education No. 362. Teachers College, Columbia University, 1929.

² Herbert A. Carroll, *Prose-Appreciation Tests*. Educational Test Bureau, Inc., Minneapolis, Nashville, and Philadelphia, 1934.

³ Norman C. Meier and Carl Emil Seashore, *The Meier-Seashore Art-Judgment Test*. Bureau of Educational Research and Service, State University of Iowa, 1930.

⁴ M. McAdory, *The Construction and Validation of an Art Test*, Contributions to Education No. 383. Teachers College, Columbia University, 1929.

⁵ K. Hevner, "A Study of Tests for Appreciation of Music," *Journal of Applied Psychology* (1931), 15: 575-583.

⁶ See Alvin C. Eurich and Herbert A. Carroll, *Educational Psychology*, Chapter VIII. D. C. Heath and Company, 1935.

systems. It is asserted that these practices have been carried over from the period which stressed mental discipline and the memorization of facts without meaning to the pupil. Two main accusations have been directed against rigid systems of examinations and marks. First, it is asserted that these practices as typically administered injure the mental health of the student; secondly, it is asserted that the emphasis in measurement should be placed upon types of learning other than the acquisition of factual information, as in the typical examination.

The danger of disturbing the pupil's mental health is stressed by one authority in mental hygiene as follows:

The mental strain, nervous tension, sleeplessness, worry, anxiety, fear, and emotional upsets occasioned by tests and examinations have laid in countless children and youths the groundwork of inferiority complexes, insecurity, convictions of worthlessness and failure, deepseated discouragement and despondence, emotional conflicts, ugly jealousies, phobias, timidities, obsessions, compulsions, compensatory maladjustments, crippling regressions and inhibitions, disease-breeding ruminations, and dissociations. Frequently, these difficulties have never been outgrown and they have sometimes developed into definite psychoses.¹

All persons in education, including the authority just quoted, recognize the values of the proper use of examinations. The objection is lodged against the use of examinations as instruments of compulsion for enforcing useless memorization and for driving pupils beyond their capacities. This objection is well taken; the young student of education should give it serious consideration in his use of examinations.

The assertion that the typical examination stresses the acquisition of factual information at the expense of other types of learning also has validity and deserves serious consideration, although the techniques for measuring nonfactual outcomes of learning are in the initial stages of development. The techniques should not be discredited because they are not sufficiently developed to be treated in detail at this point.

The types of outcomes toward which the newer practices in measurement are being directed include interests and attitudes derived from the learning experiences; work habits and study skills; ability to interpret data; ability to use facts and principles in the face of specific situations; and the ability to sense and analyze important problems.²

¹ J. E. Wallace Wallin, "Scholastic Pottage," *Progressive Education* (March, 1936), 13: 179.

² Ralph W. Tyler, "Defining and Measuring Objectives of Progressive Education," *The Educational Record* (January, 1936), Vol. 17, Supplement No. 9, pp. 78-85. See also M. E. Haggerty (chairman, Committee on Educational Research), *Studies in College Examinations*. The University of Minnesota, 1934.

The basic principles of measurement apply to the newer techniques as definitely as to the more thoroughly established ones. The main functions, criteria, and features of the better current objective examinations, discussed in the following sections, likewise apply to the newer techniques and are being used as the basis for further developments. Consequently an understanding of the following sections not only should lead to the ability to construct and use current tests of proved value but also should provide a solid foundation for evaluating and using the techniques now being developed. The information below should be supplemented by careful study of the newer developments in testing, as they appear from time to time in current educational publications.

Types of Subject-Matter Achievement Tests

The two general types of subject-matter achievement tests are standardized tests and informal classroom tests.

Standardized Achievement Tests

Since the beginning of the present century specialists in test construction and in subject matter have developed standardized tests in every secondary-school field. Odell ¹ found more than six hundred standardized subject tests on the market and available for classroom teachers. Arithmetic, reading, and language have almost a hundred each, while at least twenty-five are available for each of the following fields: algebra, geometry, Latin, English literature, stenography, and home economics. Odell states that approximately thirty million copies of the tests were sold during one year in the late twenties.

These tests have been built to measure objectively and accurately the pupil's achievement in the fields for which the tests have been prepared. They have been tried out on sufficiently large numbers of pupils to ascertain average scores and other objective measures that may be used by teachers as standards by which to judge the achievement of their classes.

The term "objective" implies that the scoring of the test is not influenced by any factor other than the one being measured. Thus a teacher's dislike of one pupil or his favorable attitude toward another will not affect the scores he gives the two pupils. In fact, the tests are so constructed that different teachers who score the same paper will give it exactly the same score, a result rarely if ever attained with the old-type

¹ Op. cit. pp. 40-50.

examination. In the latter such subjective elements as teacher's judgment, general neatness or form of the work done, pupil's personality or lack of it, or even the teacher's state of health usually affected the score, regardless of the teacher's attempt to be strictly fair. In the objective test the pupil's response is usually a single word or symbol placed to give the exact answer to the item in a manner that cannot be misinterpreted. Such standardized objective tests are available to teachers at reasonably low costs through any reputable dealer in school supplies.

A standardized test would become worthless as a measuring instrument if a teacher should coach his class on the specific items of the test and subsequently give the test to his class. A test is intended to be a sampling of a course, covering only a small percentage of the points of the course. It is assumed that pupils who answer half of the items on a given test, say, would answer half of any other set of items equally representative of the field. It is clear, therefore, that pupils coached to answer any 10 per cent of the points in a course, those carried in a given test, might make a nearly perfect score on the sample and yet have a poor understanding of the course.

To coach specifically for any test, results in another serious disadvantage to the pupils. It is likely to formalize the teaching into a dull question-and-answer procedure and thereby to kill pupil initiative and spontaneity.

Despite the grave disadvantages of the abuse of coaching for specific items which have occurred or are anticipated on tests, some teachers have engaged in the practice. The temptation is particularly great in states with state-wide testing programs, especially if teachers are rated upon the percentage of pupils passing the state-board examinations. The prospective teacher should realize that test-coaching is in extreme disrepute. One may be called successful as the result of the practice in a school administered by a superintendent who himself is ignorant of modern teaching methods, but that person if relocated in a progressive public school would soon suffer the consequences of his poor teaching habits.

Properly used, standardized tests are of inestimable value to education. They are the measuring instruments by the use of which the results of teaching can be evaluated numerically. Their specific functions are presented in a subsequent section of this chapter.

Informal Classroom Tests

The achievement tests which the teacher constructs for use in his classes are of two types: the objective and the subjective. Any teacher can

develop skill in test construction sufficient for classroom work by learning the fundamentals of test construction and by exerting the necessary care and effort. By careful practice the teacher will gradually develop for his courses tests that accurately measure the results of his teaching. When this point is reached, the homemade tests become almost as valuable as standardized tests; in fact, when the results for several classes are combined, the tests become fairly well standardized for subsequent classes. The details of constructing objective-test items are presented later in this chapter.

The second type of informal classroom test, the subjective, as usually constructed and used is of no practical value as a measuring instrument. The inaccuracy of scoring the essay written in answer to a subjective-test item is common knowledge to every student who has been graded on such a test. He wonders why he received an 80 when his friend received a 90 on a question which they had discussed the night before the test. His teacher would wonder, too, if required to give an intelligible answer, and if pressed would say eventually that he did not know or would resort to pedagogical sophistry for his answer. It is sometimes claimed that the subjective test measures literary skill, ability to organize material, and other capacities irrelevant to the main purpose of the test, which is the measurement of achievement. Two answers may be made to such claims. In the first place, it is very doubtful that the student can demonstrate his best literary skill under the stress of a timed examination; certainly no author would care to be judged by the draft he would write under such conditions. In the second place, accurate measuring devices are available for the measurement of composition ability and other abilities mentioned in the claims.

To cling stubbornly to the subjective test because of its heirloom value is like measuring cubic centimeters of water with the original old oaken bucket when a graduated beaker is at hand.

Functions of Objective Tests

As previously stated, the objective examination is the chief measuring instrument for the classroom teacher. Although the primary function of the device is measurement, it has several associated functions of much value to teaching. The order in which the six functions are presented has no relation to their importance. In each function that it performs, the objective test makes an important contribution to the work of the teacher.

To Aid Learning

Pupils may be taught to make objective items themselves to facilitate their mastery of specific points contained in any unit they may be studying. They may also be given access to the teacher's tests that are no longer used for assigning marks. Some teachers go even further and permit pupils to study their current classroom tests in advance of taking the tests, a practice which is entirely different from coaching pupils for state-wide testing programs inasmuch as the testing is limited to the one class. It is becoming a common practice for textbook-writers to include at the end of each chapter a series of objective-test items for the student's use in checking his mastery of the content covered.

The type of learning resulting from this practice is usually factual, although some items may require ability to use information. It is justifiable even when purely factual, because sound thinking in any secondary field must be based upon accurate knowledge of facts in that field.

When using objective tests as a learning device, the teacher must bear in mind that this type of learning alone is not sufficient. It may be used to lay the foundation for generalizing processes and for practice in otherwise applying facts to situations that require reasoning. For such a purpose it is an excellent device, but it should precede or supplement rather than supplant other types of learning.

To Motivate

The student's realization that his mastery of a unit will be tested objectively stimulates him to learn with a view to retention. The posting of test scores also motivates the student by enabling him to compare his record with that of his associates.

The use of objective tests as a motivation device, if overdone, may accentuate the tendency for pupils to work for marks rather than for understanding and appreciation. The teacher conscious of this possibility will note the symptoms quickly and discontinue using tests for purposes of motivation.

To Diagnose

The teacher should know the abilities and disabilities of each pupil under his charge. The diagnostic process which yields such information is largely dependent upon objective measuring devices. The extent to which objective tests have been used for this purpose is made clear by Brueckner in the following statement :

To measure and evaluate the status of behavior, aptitudes, and other traits, many measuring devices have been constructed. These include intelligence tests, general survey tests, tests for measuring achievement in the several school subjects, analytical tests which measure ability in a number of the more specific elements of which such a general activity as reading is composed, aptitude and prognostic tests for predicting future success in particular lines of endeavor, mechanical ability tests, trade tests, character tests, tests of open-mindedness, tests to measure the effectiveness of learning procedures, quality scales for measuring the merit of a performance, and many others.¹

The yearbook just quoted gives in detail the possibilities of diagnosis in reading, English, arithmetic, social studies, science, health education, speech, music, art, and leisure-time activities. The basis of diagnosis in most of these fields is some variation of the objective test. Diagnosis is therefore one of the chief functions of objective testing devices.

To Maintain Standards of Achievement

Numerical measures of achievement are essential to the maintenance of standards of scholarship. The scores of earlier groups expressed in terms of averages supply the basis for evaluating the attainment of current groups. Thus, suppose that the average score made on a certain well-constructed history test by the classes of 1933, 1934, and 1935 is 122 points and that two thirds of the pupils have scores within fifteen points of 122, that is, between 107 and 137. Such a record would give the teacher of the class in 1936 a fairly definite standard to maintain.

To Measure Accomplishment

This function is implied in each of the foregoing because it is by measuring a pupil's accomplishment that the objective test performs all its functions. There are times, however, when the measurement of accomplishment is the sole function to be performed. For example, such is the case when ability groups are being organized, when new pupils report to a school without transfer records, when marks are to be assigned, or when special examinations are given a pupil in a field in which he has studied independently. Under these conditions the purpose is not to aid learning, to motivate, to diagnose, or to maintain standards; it is to determine the status of the pupil in the given subject.

¹ Leo J. Brueckner (chairman), "Educational Diagnosis," *The Thirty-fourth Yearbook of the National Society for the Study of Education*, pp. 140-141. Public School Publishing Company, 1935. Quoted by permission of the Society.

To Aid Experimentation

It would be as impossible to conduct scientific educational experiments without objective measuring devices as it would be to conduct experiments in chemistry without weights and measures. The objective test constitutes in a large part the weights and measures of education. To illustrate, a teacher wishes to determine whether or not a given technique of teaching increases the value of his teaching in terms of increased learning by the pupils. To conduct an experiment on the problem, the teacher would first give tests to determine the amount of information possessed by his pupils at the outset of the experiment. He would then divide his pupils into two groups of equal ability in the subject and of equal learning ability. With one group he would supplement his procedure by using the technique in question. With the other group he would use identical procedures with the exception of the experimental technique. At the end of each unit throughout the year he would give identical tests to the two groups. From the numerical results he would be able to determine the effectiveness of the method, provided all other possible influences had been adequately controlled.

In almost every other type of educational experiment a similar use is made of objective measures. Usually the measures are objective tests.

To Measure the Attainment of Objectives

In the second chapter of this volume various objectives, or goals, of education were set forth. A teacher cannot be confident that the changes in his pupils are in accord with the objectives unless he is able to measure those changes accurately. Until recently little effort has been exerted to measure the growth of pupils toward the objectives of teaching. In fact, few teachers have gone to the trouble of analyzing their fields in terms of objectives or purposes, which would obviously be the first step to take in the process after the general objectives had been set forth. Since 1930, however, the problem of measuring the attainment of objectives has been definitely attacked by Tyler,¹ Eurich and Johnson,² and others. The chief instrument of measurement used in their work has been the objective test. Measuring the degree to which the purposes of education are attained is becoming increasingly important as a function of the objective test.

¹ Ralph W. Tyler, "Making a Co-operative Testing Service Effective," *Educational Research Bulletin* No. XI (May 25, 1932), pp. 289-290. Ohio State University.

² M. E. Haggerty (chairman, Committee on Educational Research), *Studies in College Examinations*. The University of Minnesota, 1934.

Criteria for Objective Tests

One of the earlier writers¹ in the field of objective tests lists five criteria for determining the value of a test: validity, reliability, ease of administration and scoring, norms, and duplicate or equivalent test forms. Eurich and Carroll² discuss three additional criteria: differentiation, adaptation to group tested, and cost. Each of the eight criteria should be clearly understood and considered when preparing or purchasing objective tests.

Validity

In general a test is valid when it gives a good measure of the student's ability in the field for which it has been prepared. Thus a history test is valid if it gives a true measure of the pupil's knowledge and understanding of that portion of history covered by the test. It is obvious that the test, to be valid, must be written in language the pupil can understand. To use in the items words outside his vocabulary or to use involved sentences which a person of the pupil's mental maturity could not comprehend would be similar to writing the items in a foreign language. Before a pupil can give his true response to an item, it is essential that he know what the item means. A valid test item covering a point will be clear to the pupil and will be limited to the field in which the pupil is being tested.

To be valid for a given field the test must be an accurate measure. If it is not accurate, it is worthless as a test, and lacks validity in proportion to its lack of accuracy in the field for which it was prepared. It must be constructed so that the teacher will not misinterpret the pupil's response. Misinterpretation by the teacher of what the child meant by his response would be a source of error as serious as the child's misunderstanding of the language of the test.

Thus validity is the primary criterion of a good test. If it is not valid in the field for which it has been prepared, it is not a test in that field; and no matter how inexpensive or how easily administered it is, or how accurately it measures something else, it is worthless to the teacher of the given field.

Reliability

One aspect of validity is reliability, or accuracy of measurement. A test that is reliable invariably gives an accurate measure of the content it

¹ G. M. Ruch, *The Objective or New-Type Examination*, Chapter II. Scott, Foresman and Company, 1929.

² Op. cit. pp. 70-76.

covers. Since this is true, it will give approximately the same score when administered twice in immediate succession to the same pupils. A test that is not reliable is like an improvised yardstick that is either too long or too short, because neither will measure accurately.

A reliable test is valid only when used in the field for which it has been prepared. Thus a reliable chemistry test if given to a pupil in history would still measure attainment in chemistry accurately, but the results would not give any light as to the amount of history the pupil knew. Thus a test may sometimes be reliable but not valid. A valid test, however, is always reliable. Validity always includes reliability, but reliable measures are not valid unless used to test the material for which they were prepared.

Ease of Administration and Scoring

Other things being equal, the value of the test is proportional to the ease with which it may be given and scored. These standards are relatively unimportant, however, when compared with validity. Unless a test possesses validity, it is worthless, regardless of its ease of administration and scoring.

A good test carries clear instructions to the teacher who is to administer it and to the pupil who is to take it. The instructions usually include a sample item for the pupil to perform for practice. Opportunity is given the pupil to ask questions about any part of the technique not clear to him. To further simplify the administering of the test, the writing required of the pupil is reduced to a minimum.

The place for the pupil's response and the character of it are selected with a view to ease of scoring. Often the spaces for answers are aligned at the left of the items to facilitate the use of a stencil in scoring. When this is not feasible, the spaces for responses are otherwise arranged to simplify the scoring. Ease-of-scoring techniques are factors in reliability as well as work-savers for the teacher, because they reduce the chance of error in scoring and thereby increase the accuracy of the test.

Norms

The average score made on a test by a large group, representative of the pupils for whom it was prepared, is sometimes designated as the "norm" for the test. The median score also is frequently used as the norm. It is the score below which the scores of half the group fall. The average or median score, when used as a norm, becomes a standard by which a teacher may judge the work of his class. Thus the value of the test is increased by norms.

Equivalent Forms

Several advantages derive from the availability of equivalent forms. A pupil absent when the class took one form may be given an equivalent form upon his return to school. Also, a pupil who had not acquired a sufficient mastery of a unit when one form was given may be given an equivalent form when he considers himself prepared. Occasionally a teacher may suspect that a pupil has cheated either by copying or by stealing and studying a test specifically. In such a case it would be well to give the pupil another form to check his mastery. Equivalent forms are also of value to teachers with several sections of a class which take the test at different hours. It is clear, therefore, that equivalent forms increase the usefulness of a test.

Differentiation

A good test, as a result of its accuracy in measurement, will produce scores that rank the pupils according to their degrees of mastery. This could not result, obviously, if the test were so easy that many pupils would answer all items or so difficult that practically all pupils would miss all items. To avoid these two contingencies, items of a test are usually discarded during its developmental stages if answered correctly by or missed by as many as 90 per cent of the pupils. The remaining items, if sufficient in number and of good reliability, will satisfactorily differentiate the pupils according to their mastery of the content.

Adaptation to Group Tested

A test cannot give a true measure of the pupil's ability in a given field if it is not drafted to fit his maturity in the subject. Thus a score of zero would carry no meaning if made by a secondary-school pupil on a test in physics prepared for seniors or graduate students in college. As stated under the discussion of validity, it is also essential that the language used in the test items be comprehensible to the student.

Cost

This practical criterion speaks for itself. Tests with answer cards which permit repeated use of the test sheets carry an advantage over those which are consumed at first use. Standardized tests which have been prepared in a highly scientific manner are in the long run the most economical, although their original cost may be somewhat greater than that of less carefully developed tests.

Types and Samples of Objective-Test Items

A new type of objective test is produced whenever a teacher or a research worker conceives a unique device that causes the pupil to respond in the intended objective manner to the test situation. Every college student has come in contact with such earlier forms of objective tests as the true-false, completion, multiple-choice, matching, and analogies types. Ruch¹ lists sixteen types of objective tests and subdivides them into a total of thirty-one kinds of items. A more recent publication presents samples of objective tests developed by a group² during several years of research. The report presents thirty-four kinds of items. In every case the sample is a decided improvement upon existing models, and in several cases entirely new testing devices have been invented. All tests produced by the group have been scientifically checked for validity and reliability. The samples given are from college courses. The present writer has selected the types which are well suited to a secondary school and has applied them to secondary-school content in the following illustrations.³

Modified True-False

The modified true-false item is a distinct improvement over the older true-false item. Although somewhat more difficult to construct, it is a more rigorous test, less amenable to guessing, and more reliable.

Sample item. (DIRECTIONS. In each of the following sentences, pick out the one word that makes the statement false and write it in the space at the left. The wrong word is never one of the first three words in the sentence.)

_____ Appropriation by the landlord of unearned increment in land values was considered by George as a real cause of progress.

A deviation in this type of item requires the student to cross out the wrong word and place on the line a word which, if inserted for the wrong one, would make the statement true. Thus in the sample above under such instructions "progress" would be crossed out and "poverty" placed on the line.

¹ Op. cit. Chapter VIII.

² M. E. Haggerty (chairman, Committee on Educational Research), *Studies in College Examinations*. The University of Minnesota, Minneapolis, 1934. (Contributions in test construction by Francis S. Appel, Clara M. Brown, Eugene D. Carstater, Alvin C. Eurich, Palmer O. Johnson, Henry Kronenberg, Howard P. Longstaff, Renata R. Wasson, and Edgar B. Wesley.)

³ In some cases little alteration is made in the item, and in most cases the type names and instructions are drawn from the committee report.

A third kind of modified true-false item, of value in spelling, presents a series of words, some misspelled and some correctly spelled. Space is provided for the student to write the misspelled words correctly or to insert the letter "C" beside the correct.

Multiple-Choice

In multiple-choice items an opening statement is followed by five suggested and numbered answers of equal plausibility. In one type, only one of the five is correct, while in a second type several may answer the item but one is distinctly better than any of the other four. The numbers 1 to 5 are listed at the left of the item (or, to save expense, placed on an answer sheet), and the pupil is instructed to draw a circle around the number corresponding to the answer he selects as the one right answer in the first type, and the best in the second. Items 1 and 2 below, respectively, are samples of the "one right answer" and the "best answer" types of multiple-choice items.

- 1 2 3 4 5 1. *War and Peace* was written by: (1) Dumas; (2) Turgenev;
(3) Tolstoy; (4) Pershing; (5) Kipling.
- 1 2 3 4 5 2. The means by which the United States carries on its relations with other nations is called: (1) Arbitration; (2) diplomacy;
(3) conference; (4) international law; (5) negotiation.

Several other kinds of multiple-choice items are as valuable as the two kinds illustrated above. One of these is the reverse multiple choice, in which the single wrong response or the worst response is to be indicated by the pupil. Another deviation of the idea is the multiple-answer type, in which appear more than one correct answer to be indicated by the pupil, such as causes of social movements, authors of a stated nationality, or other cases in which each of several answers may be equally correct. The pupil should be penalized, in this kind of item, for indicating incorrect items. This may be done by reducing his score one point for each incorrect item checked by him as correct. A third use of the multiple-choice idea is the multiple-choice analogy, which states that one thing is to another as a third is to one of five possible responses, as, for example, Italy: Mussolini:: Russia: (1) Hitler; (2) Lenin; (3) Trotsky; (4) Czar; (5) Stalin.

The multiple-choice item is one of the best types of the objective test. Its main advantages are its reliability, its control of guessing, its relative ease of construction, and its wide applicability.

Matching

The matching test has long been held valuable for testing the pupil's ability to identify relationships. Typical associations available for matching are causes with results, personages with events or dates, authors with titles, terms with their definitions, names of places with their map locations, and parts or organs with functions. The following item,¹ drawn from a junior-college examination, is an excellent illustration.

DIRECTIONS. Answer by key number.

Key No.

- | | | |
|----------------------|----------------------|----------------------|
| 1. acceleration | 7. friction | 13. specific gravity |
| 2. capillarity | 8. kinetic energy | 14. surface tension |
| 3. center of gravity | 9. momentum | 15. torque |
| 4. centrifugal force | 10. potential energy | 16. velocity |
| 5. density | 11. precession | 17. weight |
| 6. force | 12. pressure | 18. work |
1. () Pull exerted by earth on body.
 2. () Ratio of density of a given substance to that of water.
 3. () Shift in direction of axis of rotation of body under torques.
 4. () Rate of change of velocity.
 5. () Ability to do work by virtue of position.
 6. () Behavior of liquids in very narrow tubes.
 7. () Pull exerted by a body by virtue of its rotation around an axis.
 8. () Product of mass times acceleration.
 9. () Product of mass times velocity.
 10. () Product of displacement times component of force in direction of displacement.
 11. () Resistance to sliding or rolling.
 12. () Rate of change of displacement.
 13. () Force per unit area.

The excess of terms over definitions should be noted. This technique to reduce the chance for guessing should be used frequently if not invariably. A similar technique would be, in the test above, to have one or two definitions not applicable to any term listed and to penalize the pupil using them.

More than one type of relationship may be combined in some matching tests. For example, in biology² the student's knowledge of the cell was tested by having him associate terms, functions, and locations. A two-inch diagram of a cell was shown with its parts numbered. Beside the

¹ M. E. Haggerty (chairman), op. cit. p. 168.

² Ibid. p. 170.

diagram was placed a list of sixteen terms and below it a list of thirteen functions. Two columns of blank lines were provided for placing after the terms the numbers which corresponded to their location and function.

Another kind of matching test is the classification item. An illustration of the principle would be a test which listed workers in several callings, such as author, statesman, scientist, and educator, and below the list of classifications presented names of personages to be classified. Various possibilities exist for the use of the technique. For example, customs may be classified by periods, race, or nationality; literature may be classified by type; authors may be classified by nationality or period; specimens in science may be classified by order; social institutions or organizations may be classified by periods or by character, such as political and non-political; or products may be classified by vocations producing them.

Completion

The completion item is among those most frequently used. The apparent ease of its construction has resulted in abuse. Too often, as when several blanks are to be filled in a sentence, they require mental maturity beyond the pupil's level or a brilliance of mind limited to a small percentage of the population. It is therefore obvious that they should be adapted in structure as well as in content to the pupil's level.

The most frequently used type of completion item is familiar to every student. It consists of a sentence with one or more important words omitted. To facilitate scoring and to reduce expense, pupils may be instructed to write the omitted words on an answer sheet numbered to correspond with the numbers by which the omissions are designated.

Another much used and valuable form of the completion test is the enumeration item, which requires the pupil to list his responses to an introductory statement. This technique is applicable to practically every subject. For example, in social problems an item may require the listing of social trends during a period, the enumeration of the major problems of urban or rural life, or a statement of the causes of the rise or decay of an institution; in science various enumeration items may deal with scientific classifications, may call for applications of specific scientific laws, or may require lists of social outcomes resulting from scientific processes; or in literature works or characters may be enumerated, plots may be outlined, or an author's effects upon society may be listed.

Similar to the enumeration item is the tabulation item. For example, in history a biographical tabulation may be prepared by listing a num-

ber of eminent names at the left and preparing columns for such information as nationality, occupation, main contribution, century, and political policies.

Analogies also may be written as completion items; for example, "Bismarck is to German unification as ----- is to Italian unification."¹

The fact that the completion item has often been hastily prepared and thereby abused should not deter one from using it in numerous test situations. It is relatively free from guessing and chance effects, may be applied to reasoning as well as to factual material, and when adapted to the pupil's ability and prepared with care can be made highly reliable.

The Construction of Objective Tests

A rather remarkable shift of emphasis in recent years from the subject-matter topic to the objective or purpose is revealed by a comparison of the following series of steps in the preparation of objective tests. Ruch² prepared the first series in 1929, and Tyler³ the second in 1934.

1. Drawing up a Table of Specifications (Percentage of items per topic)
2. Drafting the items in preliminary form
3. Deciding upon the scope (length)
4. Editing and selecting the final items
5. Rating the items for difficulty
6. Breaking the items into alternative forms
7. Rearranging the items in order of difficulty
8. Preparing the instructions for the test
9. Making the answer keys or stencils
10. Deciding upon rules for scoring

Tyler's specifications are centered around the objectives of the course being taught :

1. Formulation of course objectives
2. Definition of each objective in terms of student behavior
3. Collection of situations in which students will reveal presence or absence of each objective
4. Presentation of situations to students
5. Evaluation of student reactions in light of each objective
6. Determination of objectivity of evaluation

¹ M. E. Haggerty (chairman), op. cit. p. 183.

² Op. cit. p. 149.

³ Ralph W. Tyler, *Constructing Achievement Tests*, pp. 5-6. Ohio State University, Columbus, 1934.

7. Improvement of objectivity, when necessary
8. Determination of reliability
9. Improvement of reliability, when necessary
10. Development of more practicable methods of measurement, when necessary

It was made clear in Chapter IX that an essential part of the introduction-and-attack stage of the unit is the setting up of objectives toward which the pupil is to direct his work. It will be assumed that the teacher who follows the unit idea in teaching will have taken Tyler's first step when developing the unit. It is probable that the teacher and the pupil will also have determined certain activities to be performed by the pupil in attaining the objectives, in becoming able "to behave" in the sense implied in Tyler's second step.

Before proceeding with this discussion one rather significant point should be presented. Although an excellent beginning has been made by the specialists in examination techniques toward the measurement of objectives of teaching, most of the objectives thus far measured have been tied to the subject matter. Objectives in zoology, for example, have been stated in terms of acquisition of facts, principles, and definitions, and in terms of such abilities as generalizing, testing hypotheses in zoology, applying principles to new situations, and performing laboratory work skillfully.¹ These are important objectives, and much credit is due the pioneers who have devised means of measuring their attainment. It is highly probable that eventually these techniques will aid in determining the degree to which the secondary-school offering carries the pupil toward the less tangible objectives set forth as the cardinal principles or the ten social-economic goals of America. These are beyond the objectives of subject matter. At present one cannot be certain that the attainment of content objectives contributes toward such ultimate objectives as the ten social-economic goals. Inasmuch as the most recently derived techniques not only measure subject matter reliably but also lay the basis for attacking the measurement of outcomes thus far largely intangible, it is important that the teacher understand the best current practice. Although objective tests differ greatly in form, there are certain rules which apply to the construction of all types. They are summarized as follows:

Specific directions. A set of clear directions is an essential part of every test. Pupils should be told in exact terms how to make their responses and where to place them. It is well to place a sample item in

¹ Ibid. p. 73.

the instructions if the type is new to the pupils or if it contains a new mode of response. Instructions should be given throughout the test at the appearance of each type of item different from previous types in the test. If the pupil does not understand the instructions, the test cannot be reliable; hence the necessity of clear, concise, exact directions.

Representativeness. Each test should be representative of all parts of the unit that it has been built to test. Similarly a comprehensive test over a year's work should represent all units covered. Furthermore, the representation should be in proportion to the importance of the parts. For example, a unit may cover three major activities or topics. If the three are of equal importance, a third of the test points should come from each. If they vary in importance, the number of items should vary to correspond.

Clear wording. Clear wording is as essential in the single item as in the directions. The item should use as few words as possible, and all words should be within the pupil's vocabulary. Long, involved sentences test intelligence and reading ability rather than the subject matter of the course. The test-maker should have an associate or a pupil read over each item to check against ambiguity or other lack of clarity.

Proper number of points. An estimate should be made of the number of points desired in a test, and enough items prepared to yield that number. Some test items, such as completion or matching items, may require several responses and therefore carry several points each; thus the number of points in the possible score is usually greater than the number of items.

If it is desired that a test fit a given time limit, the number of points will depend upon the type of item and the reading rate of the pupils. Ruch¹ and Stoddard found that twelfth-grade pupils in answering one hundred items (one point each) required 18.7 minutes for recall items, such as completion; 16 minutes for five-response multiple-choice items; and 10 minutes for true-false items. In achievement-testing, however, ample time should be allowed for all pupils to finish with some time left for reviewing items about which they had some doubt at first reading. An information test with from one hundred and twenty-five to one hundred and fifty points is of sufficient length for a forty-five-minute or fifty-minute period. Tests which require much reasoning should be somewhat shorter.

In drafting the items for a test, at least 25 per cent more should be prepared than will be used, because some will be eliminated during the process of refining the items.

Avoidance of clues. The item should contain no clue to the answer. For example, a multiple-choice item would be faulty if its preliminary state-

¹ Op. cit. p. 295.

ment ended with "an" and only one of the five choice responses began with a vowel. Care should be taken also to avoid having one item carry a key word of another item or in any other way suggest the answer for another item. For similar reasons the order of the responses to a series of items should have no system. If, for example, true-false items were alternately true and false or if every third one were false, the student would quickly learn the system.

Brief response by student. Two ends are achieved by limiting the student's response to a symbol or a single word. First, the item can be made more objective, and therefore it will be a more accurate measure; secondly, more ground can be covered in a given time when the student so responds than when his response consumes much of the testing time.

Exact recording of responses. The test item should be set up in a manner that will make it impossible to misjudge the pupil's meaning. Thus it is better in a multiple-choice item to have the pupil draw a circle around one of five figures placed at the left of the item (or on the answer card) than it is to require him to write a number in a blank placed for the purpose, because some pupils write a figure "2" like a figure "3" (especially when in doubt as to which is the correct answer). When the response is to be a word, the blank should be placed so that scoring will be facilitated.

Filing of items. The teacher should record points for items on slips or small cards and file them until needed. For each item a record should be made on the card of the unit, the topic, the answer, and the source. (Occasionally a test or a review may be given in a unique manner by using the cards in an opaque projector and flashing the items on a screen.)

Arrangement in test. The question is frequently asked whether all items of a given type should be bunched as one part of the test or whether the various types should be intermingled throughout the test. There seems to be no sound evidence which favors either plan over the other. When a set of items is being used as a learning device, however, it is probably better to preserve the sequence of the subject matter without respect to the type of item. Some have held that bunched items become monotonous, while others hold that jumbled items confuse students. Both assertions are of doubtful validity. Nor is there much weight to the claim that bunched items require only one set of directions per type, because one set suffices when items are intermingled if it is placed before the first item of each type used in the test.

Whichever plan is used, it is probably well to place several relatively easy items at the beginning of the test, for humane if not for scientific reasons.

Preparation of duplicate forms. Tests cannot be built into equivalent forms until they have been given to a sufficient number of pupils to determine the relative difficulty of the items. Before giving the tests, the

teacher may prepare two forms of one hundred items each by shuffling two hundred item cards and dealing them into two piles. Or he may give the test of two hundred items and divide it into two forms by using the odd-numbered items for one form and the even-numbered items for the other.

Having given a class the two forms, whichever way compiled, he takes the first step in determining whether or not form one is comparable with or equivalent to form two by finding the average score made by the class on each of the two forms. To obtain the average score made on form one, he would add the scores and divide the sum by the number of pupils. Suppose the average for form one was found to be 63. If an average within two or three points of 63 is found for form two, the averages may be considered nearly enough equal for classroom purposes; but one further computation is necessary to check the forms for comparability. The second check is necessary because the first average may have resulted from numerous high and numerous low scores with only a few near the 63, while the second may have had most of the scores bunched around the 63, with few high and few low scores. The forms would not be considered equivalent unless the scores were also equally bunched around the average. Suppose in a class of thirty it was found that twenty pupils had scores between 56 and 70, or within seven points of 63, say ten between 56 and 63 and ten between 63 and 70. In that case two thirds of the pupils would be within seven points of the average. Now suppose that on the other form twenty pupils came in the same manner within six, seven, or eight points of the average. This would indicate that the spread of scores was about the same on the two forms, which together with similar averages would make them sufficiently comparable for classroom purposes; that is to say, it would be fairly safe to score a pupil on the duplicate form if he had been absent when the test was given, and to record his score with those made on the first form by his classmates.

In the event that the two forms do not yield approximately the same average and the same spread or deviation from the average, it is necessary first to determine the relative difficulty of the items by computing the percentage of pupils missing each item and then to interchange items of unequal difficulty between the two forms until the discrepancies are corrected. This process can be simplified by recording on each card the percentage of pupils who missed the item and then dividing the cards into two groups of equal difficulty. Usually this simple plan of interchanging items will correct the two forms for lack of comparability.

Expert typing and mimeographing. The test should be typed and mimeographed by expert stenographers. Blurred items, faulty form and spacing, misspelled words resulting from typographical errors, and other similar defects detract not only from the appearance of the test but probably from its effectiveness as well.

Determination of reliability. Practically all eleven of the foregoing points have a part to play in making the test measure accurately. In other words, each will tend to increase the reliability of the test. Certainly a test would measure inaccurately if the pupil could not understand the directions or the wording of the items. It would be similar to a 34-inch yardstick if it covered only four of the five or six topics it was intended to measure. It could lay no claim to objectivity if it required the pupil to write several pages in response to an item. On the other hand, if the student's response is limited to placing a symbol in a specified spot, or to drawing a circle around his choice of several figures, or at most to writing a single word or a single phrase, there is practically no chance to misjudge his meaning. Furthermore, printed or skillfully typed and mimeographed test forms enable the pupils to concentrate upon the actual content rather than upon the problem of deciphering blurred lines.

All the points just discussed should be carried out before the test is given. There is an additional procedure that may be applied after the test has been given, to determine how accurately the test has measured. One way to carry out the procedure is simply to compare the records made by individual pupils upon the two halves of the test. Suppose John made a higher score upon the seventy-five odd-numbered items than anyone else and that he made the same record on the even-numbered items. If everyone else in the class held his rank as consistently as John, the teacher would be safe in assuming that the test had measured reliably. Few if any tests will measure with such a fine degree of accuracy as this. Usually a pupil's rank will change several steps between the two halves of a test, particularly if he has not ranked near the top or near the bottom. When, by inspecting the pupils' ranks upon the two parts of a test, the teacher finds marked changes in the ranks of several pupils, the test has failed to measure accurately. In such case the test should be revised by discarding all items missed as often by good students as by poor students or answered as often by poor pupils as by good pupils; by having former superior pupils of the course suggest for deletion items they cannot understand; by checking the number of points from each topic of the content to ascertain whether each topic had been represented in proportion to its importance; and by simplifying the responses required of students. Sometimes a check of the scoring will reveal that errors in scoring have been the cause of the unreliability. Consequently scores should always be checked.

One of the chief mathematical devices that have been prepared for ascertaining the degree of reliability of objective tests is discussed briefly in the following chapter.

Determination of validity. Inasmuch as reliability is an essential part of validity, everything that has been said under determination of re-

liability applies to the present section. Of particular significance to the validity of the test are the practices of filing for subsequent use items drawn directly from the course content, of adapting both content and phrasing of the item to the pupil's level, of having the test representative of the actual content of the topic as well as representative in terms of number of items, and of making the student's response clearly indicate his meaning. Usually a test will be sufficiently valid for classroom use if adequate precautions have been taken to ensure its reliability. Other devices are available, however, for determining the validity of tests. Two of the less complex methods can be used by any classroom teacher.

The first of the two methods of validating tests is that of giving the test to pupils in several different grades and comparing the results. For example, an eleventh-grade American-history test may be given to pupils in each grade, beginning with Grade Six. Should the scores invariably increase grade by grade, the teacher would have some evidence of the test's validity. Such evidence would not be absolute, however, because the wording of the items might account in part for the lower marks in the lower grades.

A second method of checking the validity of a test is to compare the results on the test with the average scholarship of the pupils. If pupils with high-scholarship records in all courses taken since entering secondary school rank high in the test and if generally poor students rank low, the teacher has further evidence of the test's validity. A mathematical technique called correlation, to be discussed in the next chapter, simplifies the process of comparison and yields a decimal fraction as an index of the degree of correspondence between the general scholarship and the test scores.

Preparation of answer sheets. Answer sheets may be prepared to coincide with the position on the test paper where the pupil would otherwise place his response, or they may be in the form of cards approximately 6 by 8 inches in size which the pupil can handle freely as he turns from page to page in the test. In either case the answer form should be numbered to correspond with the numbers beside the test items and should carry blanks for the insertion of the responses, symbols to be checked, or other objective-response devices to fit the test. For example, answer forms for improved true-false items should carry blanks for the insertion of the word which makes the sentence false, those for multiple-choice items should carry the figures 1, 2, 3, 4, 5, for each item, and those for completion items may carry numbered lines to correspond with the numbered blanks in each item of the test.

One objection to the answer sheet or answer card is the chance which either device provides for the pupil to misplace his response. This may be overcome by training the pupil to use the form and by allowing him ample

time to check his responses against the test sheets after he has finished. A little practice with the use of answer forms will greatly reduce the chances of the pupil's misplacing his responses.

Preparation of stencils and answer keys. The final step in the construction of objective tests is to prepare the scoring devices. If the student has marked the test paper rather than an answer form, a cardboard the size of the test sheet may be prepared for each page by cutting out small rectangles in the cardboard, through which the student's responses may be seen by the scorer. On the cardboard, below each rectangular opening, the correct answer for the particular item should be typed or written in red. A similar stencil may be prepared to fit over answer sheets or answer cards.

Another plan, which seems more practicable, is to place a correctly marked copy of the test or of the answer form beside the pupil's test sheets. The form may usually be folded or creased into strips so that the correct answers will fall exactly beside the pupil's responses.

Whatever plan is used, the essential point is to have correct answers on the scoring form. This may seem too obvious to be mentioned, but even teachers of experience are at times embarrassed at finding errors on their scoring keys. Keys should be checked critically at least twice before being used for correcting tests.

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CHAPTER XV · Application of Measurement

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Purpose of the Chapter

THE preceding chapter carried the discussion of measurement through the construction of objective examinations. The present chapter begins with the scoring of the tests and deals with the conventional methods of treating and utilizing test results in teaching. Several technical terms are introduced in nontechnical language, with a view to giving the teacher a clear understanding of the significance of the processes for which they

stand. Illustrations of the uses of the various measures in teaching, in research, and in recording achievement are presented. The general purpose of the chapter, therefore, is to acquaint the prospective teacher with certain important tools of the profession and to do this in the most practical way possible, through everyday classroom situations.

Scoring Objective Tests

As a general rule it is best to allow one point for each correct response in an objective-test item. The practice of allowing two or more points for each response that is considered more important than others has been discarded. Studies have proved that this practice, called weighting the scores, does not appreciably alter the ranks of pupils. The studies demonstrated that pupils who ranked high when scores were weighted also led their groups when each correct response was credited with one point and that less able students likewise retained approximately the same ranks. Sometimes, however, a single test item may carry several responses. In such items each correct response should be credited with one point.

Improved True-False

The improved true-false item of the type that requires the pupil to select the one false word yields one point when the pupil has written the selected word in the space provided.

The type that requires him to strike out the wrong word and write the correct word in the space yields two points if he does both, but only one point if he does either without the other. Sometimes such items are true statements. In such case the student writes the word "True" on the space and strikes out no word, for which one point is given in scoring. The student is not penalized for marking a false item true or for attempting to correct a true item which he considers false.

Multiple-Choice

The multiple-choice item which has only one correct response may instruct the pupil to draw a circle around the number corresponding to the correct answer. In this case one point is scored for each correct response. The reverse multiple-choice item instructs the pupil to strike out as false all items except the one he encircles. In this case he could be given five points because each of his responses might be correct. The same practice could apply to the item which carries four right answers and one wrong answer. The instructions in either case should clearly tell the pupil to

indicate both the true and the false parts of the test. This practice yields larger scores but is thought to reduce guessing.

The multiple-choice item which carries several possible answers but one distinctly better than any other should be marked only once by the pupil, and only one point should be allowed. Ranking the responses in such an item is not recommended.

Matching

For each correct response one point is allowed. Incorrect responses are ignored. These are probably the best rules to use for the matching type of item. The pupil's score is the total number of correct responses.

Completion

It is best to count one point for each blank in a completion item, even though the response contains more than one word. This rule should hold for the omitted-word type, the enumeration type, the tabulation type, and the analogies type of completion item.

Grouping Test Scores

It is frequently desirable to preserve scores made on a given test by classes over a period of years or by several sections of a current class. A simple method of grouping and tabulating the scores facilitates the making of such records.

For example, suppose over a period of several semesters two hundred and five pupils had taken a particular history test of one hundred and fifty items. Suppose also that the lowest score made by any pupil had been 21 and the highest 115. To record the results, the teacher might list the numbers from 21 to 115 in a column and beside each number place a tally mark for each pupil making that score. His record would be shorter and simpler, however, if he should bunch or combine the scores into groups or intervals of five. Scores 20 through 24 would then become the first group or interval, 25 through 29 the next. The intervals would thus run upward to the one including the highest score, which in this case would be the 115-119 interval. His tally sheet would carry the twenty intervals shown at the right.

Having prepared the column of intervals, the teacher would place a tally beside each interval for each score that fell in the interval. The tabulation would then appear as shown in Table 11.

115-119
110-114
105-109
100-104
95-99
90-94
85-89
80-84
75-79
70-74
65-69
60-64
55-59
50-54
45-49
40-44
35-39
30-34
25-29
20-24

TABLE 11. TO ILLUSTRATE THE PROCESS OF TABULATING SCORES

<i>Intervals</i>	<i>Tallies or Frequencies</i>
115-119	/// (3)
110-114	/// (4)
105-109	//// / (6)
100-104	//// // (8)
95-99	//// // (10)
90-94	//// // (12)
85-89	//// // (12)
80-84	//// // (17)
75-79	//// // (18)
70-74	//// // (21)
65-69	//// // (19)
60-64	//// // (16)
55-59	//// // (13)
50-54	//// // (12)
45-49	//// // (10)
40-44	//// // (8)
35-39	//// // (6)
30-34	//// // (5)
25-29	/// (3)
20-24	/// (2)
Number of scores	205

Several points about grouping scores may be noted from the foregoing. Although the scores above were grouped into intervals of five, any other size of interval might have been used. It is usually desirable to have from ten to twenty intervals. In the present illustration twenty intervals of five points were needed to include the entire range from 21 to 115. Had the range been from 5 to 145, or 140 points, the scores could have been grouped into twenty-one 7-point intervals, beginning with 0-6 or 5-11, or into fourteen 10-point intervals, beginning with 0-9 or 5-14. Any arrangement of scores for the first interval is satisfactory so long as the lowest score is included.

When scores are grouped into intervals, the scores lose their identity and are counted in terms of the mid-point of the interval. The mid-point is found by adding half the number of points in the interval to the lowest score of the interval. Thus in the above illustration each interval contains 5 points. Half of 5, or $2\frac{1}{2}$, would be added to 20 to obtain the mid-point of the bottom interval, 22.5. If the two scores tallied for that interval had been 21 and 23, for example, they would no longer be called 21 and 23 but instead would be called two scores of 22.5. Thus it may be seen that a slight error becomes associated with grouping, because the two scores 21 and 23 are not the same as two scores of 22.5.

The result shown in Table 11 is called a frequency distribution. It is the first process in any treatment of test results. Though quite simple, it is fundamental in educational measurement.

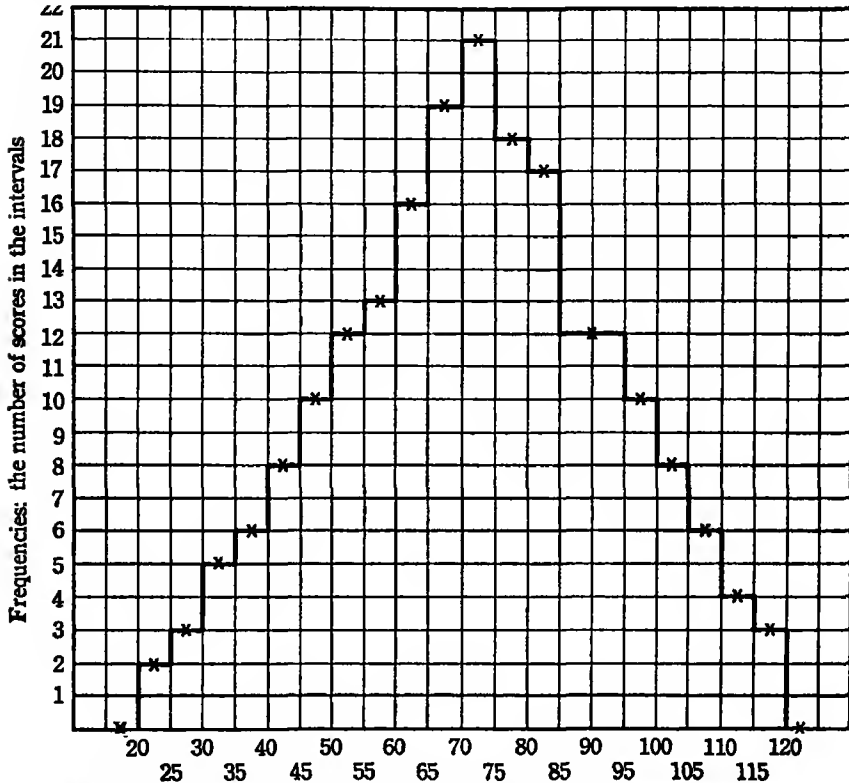


FIG. 1. ILLUSTRATING GRAPHIC REPRESENTATION OF TEST RESULTS

The student may draw a line to connect the x 's, making a curve for the distribution

Graphic Presentation of Scores

The results of tests shown in a frequency distribution may be translated into a graph within a few minutes. The graph enables the teacher to compare at a glance the work of his class with that of preceding classes or with classes elsewhere which have taken the same test. The process may be explained from Figure 1, which was prepared from Table 11. In the figure the intervals are represented along the base line and the frequencies, or number of scores within the intervals, at the left. Thus in the interval 20 through 24 (up to 25) there were two scores; so the line

is drawn over the 20-24 interval two squares above the base line. Since there were three scores in the 25-29 interval, the line is extended upward until it is opposite the number 3, then across the top of the 25-29 interval. In similar manner the line is extended upward and to the right through the 70-74 interval, then it starts downward, eventually ending with the 115-119 interval. A curve may be drawn by the reader through the mid-points of the intervals, connecting the x 's, thereby forming a curve to represent the frequency distribution of the two hundred and five scores.

If a graph of a distribution from another school were superimposed over the one presented in Figure 1, a comparison could be made quickly. Suppose, for example, in the other school the range had been from 37 to 138. The graph of such a distribution would begin over the 35-39 interval and extend beyond the right limits of Figure 1, revealing the superiority of the second group more strikingly than the frequency distributions do.

Computation of Averages

While the frequency distribution, or a "frequency polygon" as shown in Figure 1, gives at a glance the record made on a given test, it is well to have a single number to record or report as the performance of a class. The average of the scores, called the mean, and the middle score are used for this purpose. Both are considered as central tendencies of the class in its performance on the test.

The Mean

The average score, or mean, may be computed in two ways. If a class has fewer than thirty pupils, the teacher may prefer not to make a frequency distribution. In this case he may simply add the scores and divide their sum by the number of pupils. The result is the average score, or the mean. This process, while satisfactory for small groups, would be rather cumbersome for large groups. For example, several errors in addition would very likely be made if a teacher should add the two hundred and five scores which were used for the frequency distribution in Table 11. A much simpler process is to prepare a frequency distribution and proceed in a manner which may be explained from Table 12, for the two hundred and five scores previously used. Column 3, or "d" (deviation), indicates the distance each interval is from the interval guessed by the teacher to be the one in which the mean would be found. The interval 65-69 was guessed to be the one because it was near the center of the column, al-

though any other interval in column 1 might have been chosen without altering the outcome. Interval 70-74 is one interval above the 65-69; hence a positive 1 is placed in the "d," or deviation, column. Interval 60-64 is one interval below the 65-69 interval; hence a minus 1 is placed in the deviation column below the zero. In similar manner the other entries in column "d" were made.

Column 4 in Table 12, the "fd" column, is obtained by multiplying the frequencies in column 2 by the deviations in column 3. Thus the 30 is obtained by multiplying the 3 by the 10. The next step is to total the positive "fd's" for the 446 shown in the table, and the negative numbers for the -271. The algebraic sum of the two quantities (446, and -271) is 175. This sum of the "fd's" is divided by the number of scores, 205, equaling 0.854. To "correct" the 0.854 for size of interval, it is multiplied by 5, since there are five points in each interval, thereby becoming 4.27, which is added to the mid-point of the "guessed" interval. The mid-point of the 65-69 interval is 67.5. When 4.27 is added, the sum becomes 71.77. This is the mean of the series of the two hundred and five scores.

TABLE 12. ILLUSTRATING A SHORT METHOD OF COMPUTING THE MEAN

Column 1	Column 2	Column 3	Column 4	
Intervals	f	d	fd	
115-119	3	10	30	
110-114	4	9	36	
105-109	6	8	48	
100-104	8	7	56	
95-99	10	6	60	
90-94	12	5	60	
85-89	12	4	48	
80-84	17	3	51	
75-79	18	2	36	
70-74	21	1	21	(446)
65-69	19	0	0	
60-64	16	-1	-16	
55-59	13	-2	-26	
50-54	12	-3	-36	
45-49	10	-4	-40	
40-44	8	-5	-40	
35-39	6	-6	-36	
30-34	5	-7	-35	
25-29	3	-8	-24	
20-24	2	-9	-18	(-271)
Number	205		175	
Mean = $67.5 + 4.27 = 71.77$				

After one has worked five or six problems of this type, the "d" column may be omitted. Also, the "fd" entries may be placed upon an adding machine instead of in a column. If the machine subtracts, one may avoid all computation except the mental process of multiplying the frequencies by the deviations before placing their products in the machine.

The Median

The other central tendency frequently used in reporting the performance of a class is the middle score, or the median. If the teacher does not wish to prepare a frequency distribution for a small group, he may obtain the middle score, usually called mid-score, by arranging the papers in order from highest score to lowest and picking out the middle paper. Its score is the mid-score for the group. If the class contains an even number of pupils, the scores on the two middle papers may be added, then divided by two, for the mid-score.

The computation of the median of grouped scores may be performed as quickly, after the frequency distribution has been prepared, as a teacher can arrange a set of twenty-five or thirty papers and pick out the middle one. The difference is that instead of counting the actual papers he counts the scores which appear in the "f" column, usually beginning at the bottom and counting upward until the halfway point is reached. (One could as well begin at the top and count downward.) The problem first is to find the interval in which the middle point falls, and then to determine how far into the interval one need go to find the exact point. This may be made clear by reference to column 2 of Table 12. The halfway point of the two hundred and five scores would be 102.5. Beginning with the two scores in the 20-24 interval and counting scores upward in the column, one finds that the mid-point is in the 70-74 interval, ninety-four scores having fallen below that interval and enough being in the interval to exceed the mid-point (94 plus the 21 in the 70-74 interval would equal 115). Thus the first part of the problem is solved. It is clear that the mid-point is in the 70-74 interval. To come up to the score of 102.5 would require 8.5 scores above the 94, that is, $94 + 8.5 = 102.5$. Thus 8.5 of the 21 scores in the 70-74 interval would be needed to reach the median, or mid-point. Since the total distance through the 70-74 interval is 5 points, the median would fall $\frac{8.5}{21}$, or 0.40, of the 5 points beyond the score of 70, assuming that the scores are distributed equally throughout the interval. Since 0.40 of 5 equals 2, the median would be 70 plus 2, or 72.

When a distribution has been represented graphically, the median score will fall at a point along the base line to the left of which and to the right of which half of the cases or scores fall. Frequently it is called the median point for this reason. The term "median" is ordinarily used without the noun "score" or the noun "point," which it modifies.

Measurement of Variability

The Range

A common measure which adds meaning to a teacher's record of the work of his class, beyond his record of such central tendencies as the mean and the median, is the range. By "range" is meant the number of points between the lowest score and the highest score. In the illustration given above, the range was from 21 to 115, or 94 points, for the ungrouped scores.

The Quartile Deviation

Another measure which indicates variability, or the tendency of scores to spread or disperse, should be clearly understood. The measure is called quartile deviation. It is the distance in terms of points between the score below which the lowest fourth of the scores falls and the score above which the highest fourth falls. In almost exactly the same manner as that used in computing the median the point attained by a fourth of the class is determined. In the illustration being used, a fourth of the scores would be $\frac{1}{4}$ of 205, or 51.25. The scores in the lower seven intervals of Table 12 total 46, which is 5.25 short of the first-quartile point, the 51.25. Hence 5.25 of the thirteen scores in the 55-59 interval are needed to attain that position, which would carry $\frac{5.25}{13}$ of the way through the 5-point interval.

This would amount to 2.02, since $\frac{5.25}{13} \times 5 = 2.02$. When 2.02 are added to the lower score of the 55-59 interval, the first-quartile point is found to be 57.02, that is, $55 + 2.02$. By the same process it may be found that three fourths of the scores will carry through the distribution to 86.56. This is called the third-quartile point. The total distance in points between the first-quartile point and the third-quartile point is 86.56 minus 57.02, or 29.54 points. This distance is the range between the quartiles, or quartile deviation. Half of that distance, in this case 14.77 points, is the semi-interquartile range and is designated by the symbol Q . Hence, in the illustrative problem, $Q = 14.77$. It is customary to use semi-interquartile range, or Q , rather than the full interquartile range.

The Standard Deviation

If a curve were plotted from a frequency distribution with a large number of cases, say the heights of ten million male adults, it would be found to take the shape of a bell. At a certain point on each side of the peak the curve would change its shape from convex to concave. If lines were drawn downward from these two points to the base line, they would set the limits between which approximately two thirds (68.26 per cent) of the cases would fall. In such a curve the mean would be on the base line directly under the highest point of the bell, thus dividing the base line into two equal parts. The curve resulting from a distribution which would include such a large number of cases, or theoretically an infinite number, is called the normal probability curve. An important measure of variability has been derived from the facts that 68.26 per cent of the cases fall within the limits just defined and that the mean falls at the middle of the base line. It is half the distance (in terms of inches, scores, or other units) between two points equidistant from the mean which include 68.26 per cent of the cases, and is called the standard deviation. The measure may

TABLE 13. TO ILLUSTRATE THE COMPUTATION OF THE STANDARD DEVIATION

Column 1	Column 2	Column 3	Column 4	Column 5
Intervals	f	d	fd	fd ²
115-119	3	10	30	300
110-114	4	9	36	324
105-109	6	8	48	384
100-104	8	7	56	392
95-99	10	6	60	360
90-94	12	5	60	300
85-89	12	4	48	192
80-84	17	3	51	153
75-79	18	2	36	72
70-74	21	1	21	21
65-69	19	0	0	0
60-64	16	-1	-16	16
55-59	13	-2	-26	52
50-54	12	-3	-36	108
45-49	10	-4	-40	160
40-44	8	-5	-40	200
35-39	6	-6	-36	216
30-34	5	-7	-35	245
25-29	3	-8	-24	192
20-24	2	-9	-18	162
	N = 205		175	3849
Standard deviation = $\sqrt{\frac{3849}{205} - \left(\frac{175}{205}\right)^2} \cdot 5 = 4.25 \cdot 5 = 21.25$				

be computed directly from a frequency distribution without plotting the curve. The method may be explained by use of Table 13. After the "fd" column has been prepared as explained in computing the mean, only one additional column is needed for computing the standard deviation (the symbol for standard deviation is the Greek letter sigma, σ). Column 5 in Table 13 is obtained by squaring the deviations before multiplying by the frequencies. Thus the 300 in column 5 is the product of 10^2 times 3. (The result may be obtained more quickly, after the "fd" column has been prepared, by multiplying the "fd" entries by the deviations; thus 10 times 30 equals 300 .) From this point onward the following formula is used for the standard deviation :

$$\sigma = \sqrt{\frac{\Sigma fd^2}{N} - \left(\frac{\Sigma fd}{N}\right)^2} \cdot i,$$

in which Σ (sigma in another form) means "the sum of," fd^2 refers to the column just discussed, N equals the number of cases, $\frac{\Sigma fd}{N}$ indicates the sum of the "fd" column divided by the number of cases, and i equals the number of points in the interval. As shown in Table 13, the formula becomes

$$\sigma = \sqrt{\frac{3849}{205} - \left(\frac{175}{205}\right)^2} \cdot 5 = 21.25.$$

This result indicates that within the limits of 21.25 points on each side of the mean 68.26 per cent of the scores fell. In the problem being used as an illustration the mean was found to be 71.77. Thus 71.77 minus 21.25 equals 50.52, and 71.77 plus 21.25 equals 93.02. Consequently 68.26 per cent of the two hundred and five scores in this problem fell between 50.52 and 93.02. If one were actually to count the scores between these two points, they would not equal exactly 68.26 per cent of the two hundred and five because the frequency polygon of this distribution differs from the normal curve, from which the formula for standard deviation was originally derived. However, to make such a count provides a rough check upon one's computation of the standard deviation.

The standard deviation has several important uses in addition to its use as a record of the spread or the variability of a class. Only one will be explained here. That is its use to describe the performance of an individual pupil in a given group. In the illustration above, a pupil whose score was 21.25 points below the mean would be said to fall "one standard deviation" below the mean; or another, whose score was that dis-

tance above the mean, would be reported as one standard deviation, or 1σ , above the mean. In general a pupil's distance below or above the mean is divided by the standard deviation to determine his minus or plus "sigma score" on the test. Any classroom teacher may use sigma scores, as described above, in determining a pupil's relative standing in various classes. For example, if a pupil's score is $+1\sigma$ in an algebra test and -1σ in an English test, the teacher knows how the pupil stands with respect to his classmates in the two classes.

Measurement of Relationship or Association: Correlation

In the preceding chapter, in the discussion of the reliability of tests, it was stated that certain mathematical techniques had been derived which aid in the determination of the reliability of tests. The discussion of the techniques was deferred to the present chapter. One illustration of the chief technique used to determine relationship between two sets of scores will suffice to introduce the student to the field. The name applied to the technique is correlation. It provides an index which shows, for example, the degree to which results in intelligence tests correspond with results of the same pupils in algebra, or how results in English and history correspond, or how the age of pupils in a given class corresponds with their achievement. The index is numerical and ranges from $+1$ to -1 . Thus if the pupils held their same ranks on two tests, say an intelligence and an algebra test, the "coefficient of correlation" derived as explained below would be $+1$. The same pupil in this case would have ranked at the top in both tests, and the next pupil would have ranked second on both tests, and so on, through the whole class, each pupil would have held his rank in both tests. An index of -1 would have indicated that the ranks had reversed between the two tests, pupil number one in the first ranking at the bottom in the second, pupil number two in the first test ranking next to the bottom in the second test, and so forth. The degree of relationship between any two series of scores may thus be determined within the range of $+1$ to -1 . The index $+1$ would indicate perfect positive correspondence or relationship, zero would suggest (but not prove) the absence of any relationship, and -1 would indicate complete negative relationship or reversal of ranks.

The technique may be illustrated in a practical manner by determining the correspondence of scores made by a class of thirty pupils on two forms

TABLE 14. ILLUSTRATION OF THE PRODUCT-MOMENT METHOD OF CORRELATION FOR UNGROUPED SCORES

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8
Pupils	Scores on Form X	Scores on Form Y	Deviations		Deviations Squared		Products
			X	Y	X ²	Y ²	XY
1	85	83	22	19	484	361	418
2	60	58	-3	-6	9	36	18
3	42	39	-21	-25	441	625	525
4	90	90	27	26	729	676	702
5	56	58	-7	-6	49	36	42
6	73	69	10	5	100	25	50
7	38	40	-25	-24	625	576	600
8	34	45	-29	-19	841	361	551
9	81	86	18	22	324	484	396
10	67	69	4	5	16	25	20
11	43	45	-20	-19	400	361	380
12	74	72	11	8	121	64	88
13	86	89	23	25	529	625	575
14	53	55	-10	-9	100	81	90
15	50	53	-13	-11	169	121	143
16	36	41	-27	-23	729	529	621
17	91	93	28	29	784	841	812
18	54	57	-9	-7	81	49	63
19	83	80	20	16	400	256	320
20	74	68	11	4	121	16	44
21	32	35	-31	-29	961	841	899
22	56	54	-7	-10	49	100	70
23	61	67	-2	3	4	9	-6
24	72	87	9	23	81	529	207
25	68	56	5	-8	25	64	-40
26	73	84	10	20	100	400	200
27	59	51	-4	-13	16	169	52
28	61	70	-2	6	4	36	-12
29	70	72	7	8	49	64	56
30	68	54	5	-10	25	100	-50
Average	63	64	Total		8366	8460	7834

$$r = \frac{\sum XY}{\sqrt{\sum X^2} \cdot \sqrt{\sum Y^2}}$$

$$= \frac{7834}{\sqrt{8366} \cdot \sqrt{8460}}$$

$$= 0.9312$$

The first column in Table 14 consists of the class roll, with numbers rather than names to represent the pupils. The next two columns carry scores made on Form X and Form Y, respectively. The scores have been added and averaged, the average for Form X being 63 and for Form Y, 64. Column 4, headed "X," gives the number of points each score on Form X deviated from the average for that form. Thus 85 was 22 points from the mean for Form X, so 22 appears as the first number in column 4. Column 5, headed "Y," gives the corresponding deviations for Form Y. Column 6, headed "X²," presents the square of each X deviation listed on column 4, 484 being the square of 22, and column 7 gives similar squares for the entries in column 5. The last column shows the products of X deviations times the corresponding Y deviations. Thus 22 times 19 equals 418, the first number in column 8.

The last three columns are totaled. Thus the sum of the "X²" column is 8366 (this is written ΣX^2). Similarly $\Sigma Y^2 = 8460$, and $\Sigma XY = 7834$. The formula¹ for computing the coefficient of correlation, designated as r from this point, is as follows :

$$r = \frac{\Sigma XY}{\sqrt{\Sigma X^2} \cdot \sqrt{\Sigma Y^2}}.$$

Substituting the values for the three terms, the calculation is finished as shown in Table 14, the coefficient of correlation between the two forms being 0.93. This high coefficient of correlation indicates that the forms of the test are reliable measures of the pupils' ability in the content covered by the test.

One could not be certain from giving the test once that the correlation would be as high as that each time the two forms were given. By use of a short formula, however, one is able to set the range within which r has one chance in two of falling. The distance on either side of the r which marks these limits is called the probable error of r , designated $P.E._r$. The formula is as follows :

$$P.E._r = \frac{0.6745 \times (1 - r^2)}{\sqrt{N}}.$$

Applied to the present problem, $P.E._r = \frac{0.6745 \times (1 - 0.93^2)}{\sqrt{30}}$, or 0.016.

¹ Henry E. Garrett, *Statistics in Psychology and Education*, p. 169. Longmans, Green & Co., 1926. (This technique is called the Pearson's Product-Moment Formula, originally derived by Karl Pearson, of England.)

The coefficient may now be written with its probable error as follows: 0.93 ± 0.016 . Thus 0.93 plus $0.016 = 0.946$, and $0.93 - 0.016 = 0.914$. Consequently there is one chance in two that r will be between 0.946 and 0.914 . It has also been demonstrated that the chances are 9930 in 10,000 that r will fall within a limit of four probable errors on each side of the one found as above. In the present case $4 P.E. = \pm 0.064$, since $4 \times 0.016 = 0.064$. Thus $0.93 + 0.064 = 0.994$, and $0.93 - 0.064 = 0.866$; hence 0.994 to 0.866 is the range within which r would most likely fall in 9930 out of 10,000 cases. Since the lower limit, 0.866 , still represents a high degree of correspondence, the teacher would in this case be safe in calling the test sufficiently reliable for classroom use.

Measures of Comparison

Standard-Deviation Scores

Reference was made above to the use of the standard deviation (sigma) to describe the standing of a pupil in a given group. When used in this manner the standard deviation becomes a measure of comparison. For example, suppose that on a test in algebra a group of forty pupils makes an average score of 93 and that, for their distribution of scores, sigma equals 12. It would be possible to calculate each pupil's score in units of sigma by finding the difference (plus or minus) between his score and the mean, then dividing the difference by 12. Thus if the mean were 93, a pupil with a score of 115 would be 22 points, or 1.83 sigmas ($22 \div 12 = 1.83$), above the mean, while one with a score of 76 would be 17 points, or -1.42 sigmas, from the mean. The first score would be written 1.83σ and the second, -1.42σ .

When tests vary in length or in means, the sigma score becomes much better than raw scores for comparing the performance of pupils. From the illustration above, it is obvious that the sigma value of the mean is 0, since it is the starting point from which the plus or minus sigma scores are computed. In order to avoid negative quantities the zero point may be placed several sigmas below the mean. Frequently the zero point is placed five sigmas below the mean, because that distance is almost certain to include the lowest score. In the illustration above, a score of 33 would be 60 points, or 5σ , below the mean. After the shift had been made, the sigma score of the mean would become 5 instead of 0, since the zero point had been shifted 5σ below the mean. To avoid decimals the sigma scores may be multiplied by ten. Thus a sigma score of 3.6 would

become 36 and the sigma value of the mean, 50 instead of 5. Keeping these shifts in mind, the teacher soon becomes able to know the meaning of a sigma score of 68, 40, 76, or any other size for a given test.

A procedure similar to that above may be used in each subject, and the pupil's sigma score may be recorded in the teacher's record book for purposes of comparison between subjects or for reporting instead of traditional marks. The sigma scores become more meaningful after several groups have taken a given test and all their raw scores have been thrown into the distribution from which the mean and the standard deviation are derived. Pupils in each succeeding class are then compared not only with their current classmates but also with all previous pupils who have taken the test.

McCall,¹ one of the early advocates of the use of sigma scores, developed many of the techniques for the purpose. He standardized a reading test in terms of T scores by testing five hundred twelve-year-olds in a community, all those outside of school as well as those attending school, and ranging the T scores from zero to 100. Zero was set at 5σ below the mean to avoid negative numbers, and each sigma score was multiplied by ten to eliminate decimals. Thus a T score of 50 on that test was the average score made by the twelve-year-old children of that community. Such a standardized test is an excellent instrument for comparing the work of pupils in different schools as well as that of pupils in a given school or class.

Probable-Error Scores

A second general type of measure for comparing the work of pupils, in addition to the sigma score, is a similar measure based upon the semi-interquartile range (Q) instead of the standard deviation. As explained above, Q is half the distance between the first and third quartiles, or, as they are sometimes called, the twenty-fifth and seventy-fifth percentiles. The scores are called probable-error ($P.E.$) scores rather than Q scores, and use the median, or fiftieth percentile, rather than the mean as a starting point. To illustrate, suppose that the median on a test was found to be 68.5, that a fourth of the pupils, or 25 per cent, accounted for all scores up to 53.5, and that three fourths, or 75 per cent, included all scores up to 83.5. The distance between 53.5 and 83.5 would be 30, and half that distance would be 15, the semi-interquartile range, or Q . In this case one $P.E.$

¹ William A. McCall, *How to Measure in Education*, Chapter X. The Macmillan Company, 1922.

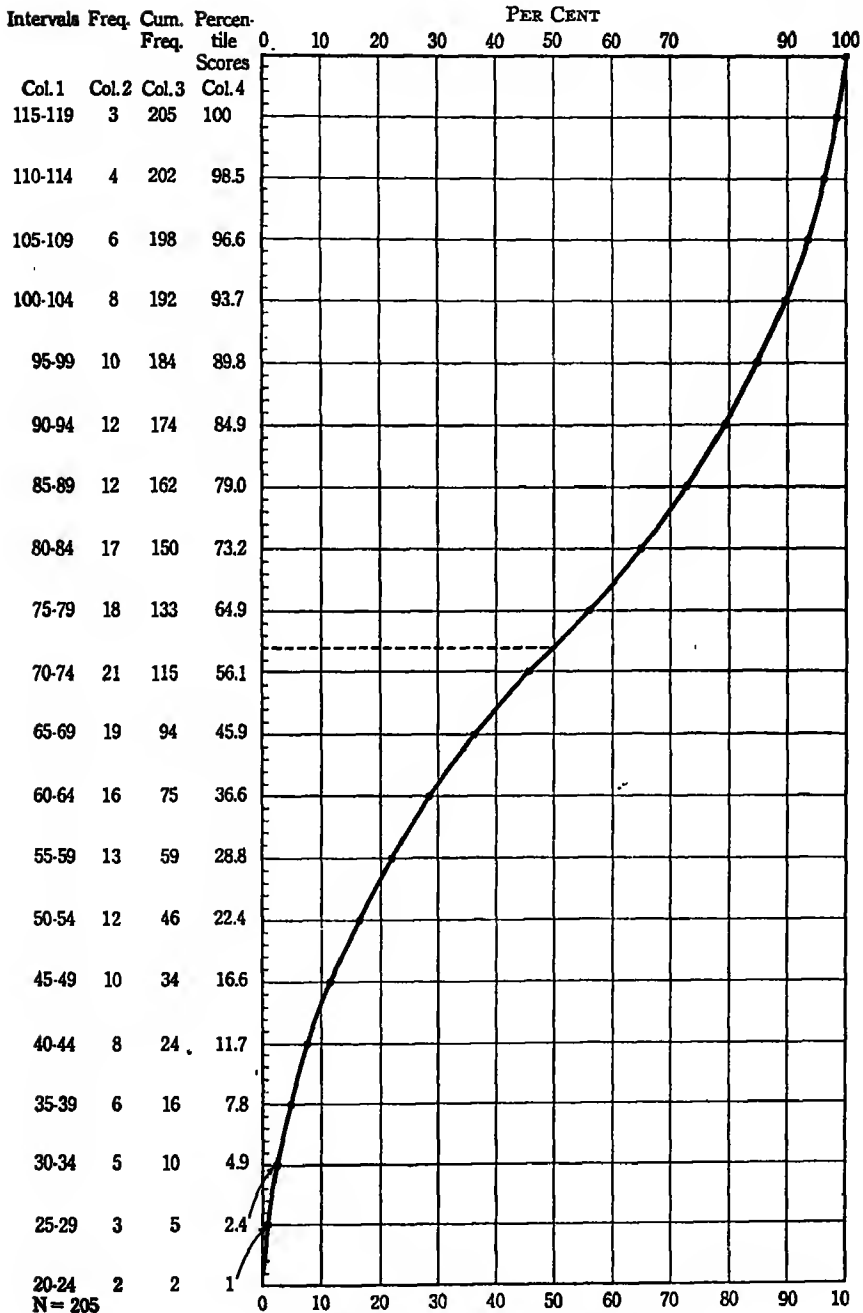


FIG. 2. ILLUSTRATING THE PERCENTILE GRAPH

would be 15 points, and, for example, a score 20 points above the median would be 1.33 *P.E.* since $20 \div 15 = 1.33$, while a score 20 points below the median would be - 1.33 *P.E.* All the applications of the standard-deviation scores, discussed above, apply to the probable-error scores.

Percentile Ranks

A third measure for comparing the performance of pupils within a group is the percentile score or percentile rank. Reference was made above to the median as the fiftieth percentile, and the first and third quartiles as the twenty-fifth and seventy-fifth percentiles, respectively. The method of computing these three percentiles has been discussed. The same procedure is used for computing the percentile rank for any score in a distribution. The procedure is illustrated in Figure 2, using the distribution shown in Table 11.

The first two columns in Figure 2 give the intervals and the frequency. The third column gives the cumulative scores, derived as follows: For the bottom interval the two cases of column 2 are carried over to column 3; to these are added the three cases in the next interval, totaling five, the second entry at the bottom of column 3. In a similar manner the frequencies in each interval, in turn, are added to the accumulated frequencies of the preceding intervals until the total of 205 is reached at the top of the column. The fourth column gives the percentage that each entry in column 3 is of the total 205. Thus the first quantity (2) at the bottom of column 3 is 0.97 per cent of 205, or approximately 1 per cent, and was so entered; 5 equals 2.4 per cent of 205; and so forth. The percentages were computed quickly by obtaining the reciprocal of 205, that is, $1 \div 205$, which equals 0.004878, and multiplying each cumulative frequency by that amount. Across the base line and the top limit the distance was divided into per cents. The graph was completed by placing a dot at the *upper* limit of each interval and as far to the right as its percentage value indicated. Thus at the upper limit of the 20-24 square the dot was placed 1 per cent of the distance across; the next was placed 2.4 per cent of the distance across; the next, 4.9 per cent; and so on to the 100 per cent in the upper right corner. Finally, the curve was drawn through the dots, as shown in Figure 2.

Once the percentile graph has been completed, the percentile rank of any score may be read by glancing at the graph at the right of the score, then downward or upward to the percentage scale. A score of 72 in Figure 2, for example, is opposite the point at which the curve crosses

the middle, or median, vertical line. It is therefore the fiftieth percentile, or the median of the distribution. It is therefore unnecessary to compute a percentile rank for each score on a test; instead the graph may be used for reading percentile ranks.

After several groups have taken a test, all scores, several hundred if possible, should be thrown into one distribution and a percentile graph prepared. Scores made subsequently may be translated into percentile ranks immediately from the graph without preparing a new graph for each group. This is the chief value of the percentile graph. Its use for comparing test scores in this manner is widespread and highly practical, although less valuable than the sigma-score method. The relative value of the two devices is treated later in this chapter.

Measurement in Educational Research

The discussion in this chapter thus far has dealt with the usual classroom applications of measures of central tendency, variability, relationship, and comparison. The classroom teacher is confronted with still another important phase of measurement, namely, the application of measurement to educational research. An understanding of measurement in research is of twofold importance to the teacher. In the first place, he may wish to conduct research himself — for example, to measure the achievement of his pupils when different classroom methods are used. In the second place, the teacher can gain full value from the reports of other research when he understands the measures used. These two points should be held in mind during the following discussion of the use of measurement in two of the three main types of educational research.

The three main methods of educational research are the historical, the survey, and the experimental. In general the historical method in education attempts to portray and interpret the past; the survey method attempts to analyze and explain the present; the experimental method attempts to improve and devise educational practices for the future. Only the survey method and the experimental method will be illustrated at this point, inasmuch as the historical method usually makes little use of educational measurement.

The Survey Method

Survey studies far outnumber other types of studies in the field of education. Such titles as the following are typical survey studies: "Cur-

rent Practices in Marking," "Methods of Reporting School Achievement to Parents," "The Use of Visual Aids in the Schools of Monroe County," "A Survey of the Achievement in Arithmetic in the Edina Public Schools," "A Building Survey of the Philadelphia Public Schools," "Activities of Parent-Teacher Associations in Arizona," "Procedures in Assignment-making," and "Provisions for Bright Pupils in Dixon-County Schools." Several thousand such studies are conducted annually by teachers and other educational workers.

Various sources are drawn upon for data in the survey method, some of which are questionnaires made by the investigator, textbooks, test records, school marks, other school records, and earlier studies of the same problem. In surveys the first step is to define one's problem. Thus Krantz¹ became interested in the problem of discipline and at the outset limited his study to typical disciplinary problems and their management in the high school. The second step is to determine the source of data. In the study just cited Krantz prepared a questionnaire and submitted it to five hundred selected schools in the north-central states. His final returns came from one hundred and fifty-six principals. Following the collection of the data come the analysis, tabulation, description of findings, and interpretations. Krantz analyzed his data first by dividing the schools into three groups according to enrollment. Schools with enrollments under 125 constituted one group, those with enrollments of 200 to 325 constituted a second group, and those with enrollments exceeding 400 constituted a third group. Several tables were then built for each group, to reveal the occurrence of disciplinary problems and the methods used for their treatment. The main findings revealed by the tabulation were then described. Finally, the tables were studied critically with a view to the discovery of trends or tendencies common to one or more of the three groups of schools. Such a study as this is a typical survey study of the questionnaire type.

The textbook type of survey is illustrated by Clarke's² study of the incentives to study carried in junior-high-school mathematics textbooks. In this study twenty-four recent textbooks in the field of junior-high-school mathematics were analyzed to determine the extent to which available incentives had been used by their authors. Such incentives as

¹ LaVern L. Krantz, "A Study of the Typical Disciplinary Problems and the Practices of Administering These Problems in the High School." Unpublished master's thesis, The University of Minnesota, 1930.

² Mildred Z. Clarke, "Pupil-Incentives to Study in Some Recent Junior-High-School Mathematics Textbooks." Unpublished master's thesis, The University of Minnesota, 1931.

illustrations, color, games, competition, achievement records, standardized material, allowance for individual differences, and chapter or unit tests were found to be "far from universally used" by the authors of recent textbooks. It was also found that authors varied widely in the number of different incentives used and in the number of times any one was used. Differences were found also in textbooks for different grades, incentives being more frequently used in texts for Grade Seven than in texts for Grade Eight or Grade Nine.

Numerous survey studies of these types and others may be and are conducted to answer various questions relative to practices in method, curriculum, supervision, and administration of schools. The findings are valuable to the profession. Not only do they reveal the practices most frequently used; they also place before the profession the new ideas being tried out by other teachers and school officials.

In many survey studies such as the two described above, little use is made of quantitative measurement except in counting the number of times each practice occurs and in calculating percentages. In other survey studies objective tests are used to measure and to compare pupil achievement. In such cases the measures of central tendency, comparison, and sometimes those of relationship may be used. For example, suppose a teacher wishes to know the relationship between intelligence and success in algebra. Scores on intelligence tests and scores on algebra tests would be collected from the school records for a large group of students, and the two sets of scores would be correlated in the manner explained earlier in this chapter. The first part of such a study would be purely survey, while the second part would be the application of the measure of relationship to the data collected.

Quite often the most prevalent practice revealed in a survey study is set forth as a standard or norm. Again the median or the mean made by a relatively large group is suggested as the norm or standard. Because the survey method sometimes derives norms, it is also called the normative method¹ or the survey-normative method.²

The Experimental Method

The experimental method, although not so often used as the survey method, is unquestionably the most valuable method of educational re-

¹ John C. Almack, *Research and Thesis Writing*. Houghton Mifflin Company, 1930.

² Carter V. Good, A. S. Barr, and Douglas E. Scates, *The Methodology of Educational Research*, Chapter VII. D. Appleton-Century Company, Inc., 1936.

search. It seeks to improve educational practice through scientific experimentation. McCall¹ describes three types of experimental technique in teaching: the one-group method, the equivalent-groups method, and the rotation method. The processes may be explained by reference to typical experiments.

One-group method. As the name implies, this method is used with a single group of students, say in a small school in which there is only one section of a class. If, for example, a teacher wished to determine the effect of using a workbook in teaching American history, he would use the workbook with the one group, and there would be no second group to be taught without the workbook and thereby held as a control group. The lack of a control group makes the one-group method somewhat unsatisfactory because the teacher cannot know with certainty that the device with which he is experimenting causes the results apparent from the study. This difficulty is overcome to some degree by comparing the results obtained from previous or subsequent groups with which the experimental device has not been used.

If a teacher were to use the one-group method in determining the value of a workbook in history, the procedure would begin with a thorough test over the content to be studied. The scores would be carefully recorded. Then the class would proceed with its study of the field, using the workbook. At the end of each unit a test would be given and the results recorded. At the end of the year the test given at the beginning would be administered again, and the gain between the two dates would be computed and recorded. If the same tests had been used the previous year, before the workbook had been added to the instructional devices, the teacher could determine in which year the class had made greater achievement, and how much the difference had been. Or he could lay aside the workbook the following year and apply the same tests used during the experimental year.

It would be necessary not to vary the procedures or the conditions under which the class worked, except in the one respect, namely, the use of the workbook. The same teacher should teach both years, the same content should be covered, the class should meet at the same period, and devote approximately the same time and attention to the subject. Even more important, the classes during the two years should be of approximately the same mental ability and of the same scholastic level in the subject.

If comparative data from previous or subsequent classes are not available, it is still possible to use the one-group method, provided reliable and

¹ Op. cit. Chapters VI-VIII.

comparable tests have been devised. In this case the teacher would give the initial test, as before, at the beginning and at the end of each unit, but would use the workbook only for alternate units. For example, suppose the mean increased 90 points for unit one between the initial and the final test for which the workbook had been used, but only 60 points for unit two without the use of the workbook. If the differences were invariably in favor of the workbook throughout the year, the results would strongly suggest that the workbook had been an effective device. A serious difficulty confronted in this procedure is that of devising comparable tests. Suppose a gain of 90 points on one test meant no more than a gain of 60 on another test. This might often be the case if tests of unequal difficulty were applied. Obviously, under such conditions the difference between the two tests would not have resulted from the experimental device but from the tests themselves. Consequently great care must be taken in interpreting the results of the one-group method.

Still another difficulty arises when the class is not equally ignorant of the alternate units. To illustrate, a class might make a mean of 80 on the initial test of a hundred and fifty items for one unit and a mean of 20 on a test of the same length for the next unit. If all pupils should master every point in unit one and make an average score of 150, the mean would have increased only 70 points, whereas complete mastery on the test for the second unit would raise the mean 130 points. Sometimes an attempt is made to overcome this difficulty by computing the percentage of possible gain between the initial and the final test. Thus if the mean were increased from 80 to 140 on a test of a hundred and fifty items, the percentage of possible increase would be 85 (60 points of a possible 70). If all the items on the test were of the same difficulty and if ample time were allowed all pupils to complete the test, this procedure would tend to overcome the difficulty. But if the test gradually became more difficult, the method would be unsound because each succeeding item would require greater insight and knowledge. The situation would become somewhat analogous to reducing one's time on the hundred-yard dash. It is fairly easy for a runner at the opening of the season to reduce his time from 16 seconds to 13 seconds, but extremely difficult later to reduce it from 13 seconds to 10 seconds.

In spite of the difficulties which attend the one-group method it is frequently used and has some value in aiding the teacher in his attempts to determine which procedures are best for him. The value derived is entirely dependent upon the reliability and validity of the measuring instruments used, and upon the teacher's ability to employ measures of central tendency, of comparison, and occasionally of relationship.

Equivalent-group method. The equivalent-group method differs from the one-group method in having a control group upon which the experi-

mental device is not used, in addition to the group upon which the experimental device is used. The first step in the equivalent-group method is to select two groups in such a manner that in learning ability and in achievement they will be as nearly equal as possible in the subject in which the experiment is to be conducted. For each student of a given ability in one group there should be one of the same ability in the other group. It is necessary to give intelligence tests to ascertain potential learning ability and achievement tests to determine the pupil's knowledge in the field before he studies the content to be covered in the experiment. Thus, so far as possible, for each pupil in group one with an I.Q. of 115 and an initial score of 75 there should be one in group two of approximately the same ability. This process is called pairing, or matching, the students, or equating the groups. Other points upon which they should be paired so far as possible are previous marks, sex, age, study habits, and home environment. Of the several bases for pairing, the achievement score in the subject to be studied and the intelligence measure are the most important and should be considered first. The other factors also should be considered, if possible, after the pairing has been done by the use of achievement and intelligence scores.

A rough measure of equivalence of two groups is a similarity of means and standard deviations in an achievement test over the field to be covered, and a similarity of means and sigmas also on an intelligence test. This is a convenient method when groups of unequal size are being used. Groups may be considered equivalent if their means and standard deviations are approximately equal on the two kinds of tests. Groups may be equated also by chance methods, such as placing the names on cards, shuffling, and dealing the cards into two groups; but it is safer to equate by similarity of means and sigmas, and safest to pair student for student as in the manner explained above. It is sometimes advisable to give the initial test at the beginning of a term, to conduct the classes in the usual manner for a month, and then to give the test again. This process adds rate of growth as a basis for pairing, which is perhaps as valuable as any other variable one could use in equating the groups for an experiment.

After the groups have been equated the experiment may be started. Both groups should be taught in exactly the same manner, with one exception. With one group the experimental technique or factor would be used, whereas with the control group it would not be used. For example, if the experiment were to test the value of the workbook in history, all conditions would be made the same for both groups, including the teacher, the textbook, the references, the number of hours of study, the half-day when the subject is taught, the classroom, maps, globes, and so forth. The only difference would be that the experimental group would use the workbook and the control group would not.

Achievement tests should be given at the end of each unit and the scores recorded beside the scores on the initial test. The original test should be repeated at the end of the year.

The periodical tests make it possible to ascertain whether or not the results have consistently favored either group. A comparison of the initial and final scores will reveal total growth. The procedure usually followed is to compare the gains made in the means. Suppose the mean for the control group at the beginning of the experiment had been 40 and that its mean in the final had been 120. Its gain in mean would have been 80 points. Now suppose the initial mean of the experimental group had been 34 and the final mean had been 130. The gain in mean would have been 96 points. The question which would arise is whether or not the difference of 16 points between the two gains, 80 and 96, is of any significance.

The process by which the question may be answered may appear somewhat lengthy, but being certain of one's answer is worth the effort required to answer the question correctly. The first step is to calculate the four standard deviations: one for the scores of each group on the initial test, and one for each group on its final test. Let us assume that the four standard deviations had been calculated and were as follows: 15 for the control group's initial test and 12 for its final test; 14 for the experimental group's initial test and 11 for its final test. The data would then appear as follows:

	<i>Initial Test</i>		<i>Final Test</i>		<i>Gain in Mean</i>	
	Control Group	Experimental Group	Control Group	Experimental Group	Control Group	Experimental Group
Mean (<i>M</i>)	40	34	120	130	80	96
Standard deviation (<i>σ</i>)	15	14	12	11	(Difference in gains: 16)	

The next step is to calculate the "standard error" of the four means. (The symbol sigma is used to designate both standard error and standard deviation.) The formula for the purpose uses the number of cases (*N*) and the standard deviation for the distribution of scores. It is as follows:¹

$$\sigma_M = \frac{\sigma_{dis}}{\sqrt{N}}$$

Substituting the values in the formula, assuming 25 to be the number of pupils in each group, the problem for the control group's initial test becomes

$$\sigma_M = \frac{15}{\sqrt{25}} = \frac{15}{5}, \text{ or } 3.$$

¹ Garrett, op.cit. p. 121.

Since the mean was 40, the result would be written 40 ± 3 ; and it would be read, "Forty plus or minus three." In a similar manner the standard errors of the other three means would become 120 ± 2.4 for the final test of the control group, 34 ± 2.8 for the initial test of the experimental group, and 130 ± 2.2 for the final test of the experimental group. The means and their standard errors would appear as follows:

	<i>Mean and σ for Initial Test</i>	<i>Mean and σ for Final Test</i>
Control group	40 ± 3.0	120 ± 2.4
Experimental group	34 ± 2.8	130 ± 2.2

A second formula is needed at this point to determine the standard error of the difference between the two means for the control group, and similarly the standard error of the difference between the two means of the experimental group. Garrett¹ provides a formula for the purpose, in which there are no terms new to the reader. It uses the measures computed as shown above, namely, the standard errors of the means, and is as follows:

$$\sigma_{diff.} = \sqrt{\sigma^2_{M_1} + \sigma^2_{M_2}}$$

In words, the formula reads, "The standard error of the difference between two means equals the square root of the sum of the squares of the standard errors of the two means." Substituting in the formula, the standard error of the difference between the two means for the control group becomes

$$\sigma_{diff.} = \sqrt{3^2 + 2.4^2} = \sqrt{9 + 5.76} = \sqrt{14.76} = 3.8.$$

The actual difference between the two means was 80, since $120 - 40 = 80$. Thus the difference is written with its standard error as follows: 80 ± 3.8 . In a similar manner the standard error of the difference between the two means for the experimental group becomes 3.6. When written with the actual difference ($130 - 34 = 96$) it becomes 96 ± 3.6 .

The final calculation deals with the difference between the 96 and 80, which are the two actual differences between means of the two groups. Is the 16, the difference between the two differences, of any significance? The same formula is used again, but this time it is applied to the standard errors of the two differences. Substituting, the problem becomes

$$\begin{aligned}\sigma_{diff.} &= \sqrt{\sigma^2_{diff.1} + \sigma^2_{diff.2}} \text{ OR} \\ &= \sqrt{(3.8)^2 + (3.6)^2} = \sqrt{14.44 + 12.96} = \sqrt{27.40} = 5.2.\end{aligned}$$

¹Op. cit. p. 129.

The answer is written 16 ± 5.2 . If a difference is more than three times its standard error, it is said to be statistically significant. The 16 is 3.1 times its standard error ($16 \div 5.2 = 3.1$) and may therefore be said to be statistically significant. The chances are 9999 in 10,000 that the true difference is greater than zero; that is, one may be practically certain that the difference of 16 between the two gains in this experiment represented a real difference.

Thus, if the experiment had been conducted instead of invented for the purpose of illustration, the teacher could conclude that the workbook had been associated with a real difference in the achievement of the groups. He might not wish to say that the workbook had caused the significant difference until he had repeated the experiment several times with various groups.

From the foregoing discussion it is entirely clear that experimentation with the equivalent-group method is largely dependent upon measurement. It is considered the soundest of the three methods here discussed.

The rotation method. The rotation method is used when several groups are available but when class schedules or school policies prevent equating them. It consists of having each group, in turn, use the experimental technique. Careful records are kept of the performance of each group, and differences in gains are treated as explained above.

It is possible to use more than one experimental factor in the rotation method of experimentation. To illustrate, assume that a teacher has three classes of first-year science each day and that he is curious to know whether or not his instruction would be improved by greater use of visual aids and by a workbook. After administering an initial test to all three groups he would begin using visual aids according to a definite plan with one group, a workbook with the second group, and his regular procedures with the third group. After one unit had been completed he would administer a test over the work covered by the three groups, and then use the visual aids with group two, the workbook with group three, and his regular methods with group one. The rotation would continue after the test had been given at the end of the next unit. This time the visual aids would be used with group three, the workbook with group one, and regular methods with group two; as before, a test would be given all three groups to cover the third unit. Thus at the end of eighteen weeks, or one semester, each group would have had six weeks with visual aids, six weeks with the workbook, and six weeks with the regular procedures. The process would be repeated during the second semester and the results compared to determine which of the three procedures had been associated with the best scores on the tests. Whatever differences there might be would be treated for significance as in the case of the equated-groups methods.

Although this method is valuable, several points should be considered in interpreting the results.¹ If the teacher had been an ardent believer in visual aids, he might have caused his groups to become more enthusiastic when using them than at other times. The same might be true of the workbook. Also, the pupils might respond heartily to either device because it was new and interesting. Furthermore, in some cases the test might contain items covered only by the visual aids or by the workbook and therefore be unfair. It is entirely likely that habits of study developed during six weeks with the workbook might carry over with the group after they had returned to the regular methods for a unit. Some pupils might form a distaste for one of the devices, or for regular procedures after having used the visual aids or the workbook. Any one of these points should be considered in drawing conclusions from a rotation experiment. Usual differences between groups might be rotated out by the method, but such tendencies as those just mentioned will remain in force. Consequently allowance for them should be made in interpreting the results of a rotation experiment.

The Problem of Recording Pupil Progress, and Its Relation to Measurement

It is probably true that the beginning teacher will be required to use the marking system he finds in operation wherever he secures a position. Nevertheless he should have a clear understanding of the purposes and techniques of all systems of marking, because various trends are current in the field of marking which are directed toward much needed improvements. Many leading educators deplore the traditional systems of marking and are seeking sound measures to replace them.

Purposes of Marking

The purposes of marking in 258 schools are shown in Table 15. Keeping parents informed of pupil's progress and furnishing a basis for promotion were considered purposes of marking by more than 90 per cent of the schools surveyed. Approximately three fourths of the schools which reported to Billett used marks also as a basis for promotion, as a motivating device, and as a basis for awarding honors. More than half the schools considered marks in guiding the curricular and extra-curricular work of students and in recommending them for college. Only a fifth of these schools purposely used marks as a basis for research.

¹ See McCall, op. cit. Chapter VIII, and Harl R. Douglass, *Modern Methods in High School Teaching*, Chapter XVI. Houghton Mifflin Company, 1926.

TABLE 15.¹ PURPOSES SERVED BY MARKS IN 258 SCHOOLS

<i>Purpose</i>	<i>Frequency</i>	
	Number	Per Cent
1. Keeping parents informed of pupil's progress	244	95
2. Furnishing a basis for promotion	238	92
3. Furnishing a basis for graduation	212	82
4. Motivating pupils	194	75
5. Furnishing a basis for the awarding of honors	190	74
6. Furnishing a basis for guidance in the election of subjects	158	61
7. Furnishing a basis for guidance in college recommendation	155	60
8. Furnishing a basis for determining extent of participation in extra-curriculum activities	133	52
9. Furnishing a basis for guidance in recommendation for employment	113	44
10. Furnishing a basis for awarding credit for quality	100	39
11. Furnishing a basis for research	50	19

One important purpose of marking not reported by the schools is that of apprising the pupil of his progress, not merely to motivate him but to let him know, as the chief person concerned in the matter, just what he has achieved. This purpose, like those reported to Billett, may be fulfilled without the use of the traditional systems of marks. Many teachers have found that the chief purposes of marking may be achieved better by recently developed devices than by the typical methods of marking which the innovations are replacing. Both the old and the new are considered in the present section to offer the student a general understanding of the problem.

Current Methods of Recording and Reporting Pupil Progress

A number of years ago many public schools discarded the percentage system of school marks and in its place substituted letter grades. During the transition period some schools attempted to set up a system of equivalents to enable parents to interpret the letter grades. For example, one school reported to parents that a grade of A was equivalent to 96 through 100 per cent; B, 88 through 95 per cent; C, 80 through 87 per cent; D, 70 through 79 per cent; F, below 70 per cent. Gradually this practice decreased as parents became familiar with letter grades.

More recently there has been a movement to eliminate the idea of marking, because of its tendency to emphasize the making of marks over the more fundamental values of learning. Some schools use other schemes

¹ Roy O. Billett, *Provisions for Individual Differences, Marking, and Promotion*, National Survey of Secondary Education, Office of Education Bulletin, 1932, No. 17, Monograph No. 13, p. 449. United States Government Printing Office, 1933.

than letter marking in their elementary schools but retain the letter plan for secondary schools because the secondary-school pupils have been accustomed to it through the elementary grades. At present the movement is growing to substitute a sound basis for recording pupil achievement in the place of the very questionable practice of letter marks.

Traditional methods. Current plans of marking are reported by Billett in his summary of the marking systems found in 258 selected school systems. Table 16 reveals that letters or other symbols, such as the numbers 1, 2, 3, 4, 5, were used as marks in 81 per cent of the 258 schools studied. Percentages were still used in 26 per cent of the schools, some schools using both plans. Billett found that most schools with letter or number grades used five grades, either A, B, C, D, and F or some other series of five letters, or five numbers, either 1, 2, 3, 4, and 5 or the Roman numerals I, II, III, IV, and V. Some schools, however, had only two grades: pass and fail.

TABLE 16.¹ FORMS IN WHICH MARKS ARE ISSUED

	Frequency	
	Number	Per Cent
Letters or other symbols	210	81
Percentages	67	26
Class ranks	25	9
Percentile ranks	7	3
Written records or logs of pupils' progress	4	2
Accomplishment quotients	2	1
Sigma scores	2	1

The accomplishment quotient. The accomplishment quotient (A.Q.), used by two schools surveyed by Billett, when first devised attempted to compare a pupil's actual achievement with his potential achievement.² Potential achievement was determined by the pupil's intelligence quotient. Actual achievement was determined by relating the pupil's achievement to the achievement of the average for pupils of his age, and the result was called his educational quotient. This E.Q. was divided by the pupil's I.Q. to find his accomplishment quotient (A.Q.). Thus the child whose A.Q. proved to be 100 was assumed to be working up to his capacity, while those with A.Q.'s below 100 were thought to be wasting part of their time and those with A.Q.'s above 100 were thought to be working above their potentialities. For a period of five or six years the idea spread

¹ Billett, op. cit.

² Raymond Franzen, "The Accomplishment Quotient," *Teachers College Record* (November, 1925), 21: 432-440.

rapidly. Then it was noted that brilliant children who were apparently exerting their best efforts were making lower A.Q.'s than inferior pupils who were also doing their best. At first this result was hailed as a symbol of justice. The underdog was having his day; the bright loafer was getting his just dues. Eventually, however, the grave fallacy of the idea was explained by Toops and Symonds,¹ Freeman,² and others. It was proved theoretically and statistically that the use of the A.Q. in marking actually penalized the bright pupil. After the fallacy of the A.Q. had been demonstrated, its use declined. Now it is not widely recommended as a means of recording or reporting achievement.

Standard-deviation (sigma) scores. It may be noted in Table 16 that two schools used sigma scores as marks of achievement. The discussion of standard-deviation, or sigma, scores earlier in this chapter explains the value of the practice. The standard deviation, as previously explained, is derived from the normal probability curve. Consequently a marking system which uses sigma scores is really based upon the normal curve and is unsound unless the number of scores is sufficiently great to yield a normal curve when plotted. It should be clear, then, that sigma scores are valuable only when based upon a much larger number of scores than are available from a single class. Scores from a given test kept over a period of semesters or scores from several sections should be thrown into one distribution until a curve is obtained which closely resembles the normal curve, if the sigma scores are to be used as permanent records. This may be done also by compiling scores made on comparable tests.

There is little value in using sigma scores based upon a test given to a small group. Such a practice has a serious disadvantage in appearing to be scientific when it is not.

Probably the greatest difficulty which confronts the use of sigma scores as marks is the newness of the idea to parents, pupils, and teachers. This difficulty, like the similar difficulty which formerly confronted the use of letters, will disappear if the plan proves satisfactory and becomes widely used in a sound manner.

Percentile ranks. The percentile rank as a method of reporting or recording achievement has several of the advantages of the sigma score. It compares the student either with large groups, as should be the case when used for permanent records, or with pupils of his single group, as might be the case for immediate purposes. Like the sigma score, it is a better method than letter grades as they are generally used, because it is less subject to the teacher's judgment and therefore carries a more substantial meaning. On the other hand, the percentile rank has two disadvantages

¹ Herbert A. Toops and P. W. Symonds, "What Shall We Expect of the A.Q.?" *Journal of Educational Psychology* (December, 1922; January, 1923), 13: 513-528, 14: 27-38.

² Frank N. Freeman, *Mental Tests*. Houghton Mifflin Company, 1926.

which the sigma score does not have. In the first place, both pupils and parents would associate it with the discarded percentage system of marking, which was based largely upon the teacher's judgment. In the second place, the system assumes that a difference between two adjacent percentile ranks is equal at all points on the distribution; that is, for example, the difference between percentile ranks 48 and 49 is numerically the same as the difference between percentile ranks 95 and 96. Actually, however, the difficulty of increasing one's percentile score from 95 to 96 is much greater than the difficulty of raising one's percentile score from 48 to 49, because, as the upper limit is approached, it becomes increasingly difficult to increase one's rank by one point. This disadvantage is overcome in the case of sigma scores; the difference between any two sigma scores is the same all along the line. Consequently the sigma-score plan has all the advantages and none of the disadvantages of the percentile rank and is to be preferred over it as a means of reporting or recording achievement.

Letter marks based on the normal curve. A few teachers have assumed that the normal curve carries certain magic properties which solve the problem of marks. Some have gone so far as to use for small classes a system of percentages presumably based upon the normal curve. For example, an occasional teacher rigorously (and foolishly) follows the plan of giving 7 or 8 per cent of his pupils A's each six weeks; 20 to 25 per cent, B's; 45 to 50 per cent, C's; approximately 20 per cent, D's; and the rest, F's. Such a teacher usually tries to give 2 or 3 per cent F's for fear of violating the magic of the curve. This plan is very absurd because it is based upon the false assumption that the scores of each class if plotted would yield a normal curve. It would be better for the pupils if such a teacher had never heard of the normal curve.

On the other hand, there may be some value in using a large number of scores as the basis for a curve (normal or otherwise) which would guide the teacher in assigning marks. Billett¹ found, among the 258 schools studied, 73 which were following such a plan. Some of the schools gave 2 per cent A's, others 16 per cent, the average for the 73 schools being 8 per cent A's. The average for B's was 21 per cent; for C's, 43 per cent; for D's, 20 per cent; and for F's, 7 per cent. If the plan is to be used, it would probably be better for all schools to use approximately the same percentages for the marks; that is, 7 or 8 per cent A's and the same per cent F's, about 20 per cent B's and the same per cent D's, and the remainder C's.

The value of the idea may be questioned, however, because if marks must be given, the sigma score itself may be used rather than a letter arbitrarily set to represent certain areas under the normal curve. The sigma score is an actual number which has real meaning, and its steps or

¹ Op. cit. p. 440.

units are numerous enough and small enough to record accurately all levels of ability. The fact that some teachers at present do not fully understand the techniques involved in using sigma scores as records of achievement should not retard the use of the idea, because the techniques may be quickly learned. And once learned, they offer a better explanation of achievement than can be found for letter marks. When letters are based upon sigma scores, not only are the letters superfluous but they are also likely to acquire false meanings.

Statements of mastery as records of achievement. Many educators believe that any system of marking, even the sigma-score plan, is fundamentally unsound because it emphasizes values that are extraneous to learning. Whatever artificial plan is used for marking pupils, the making of high marks tends to overshadow learning and the use of knowledge in the life of the learner. According to the more progressive teachers this tendency is sufficient ground for discarding all marking schemes and for using statements of tasks successfully completed for the recording of pupil progress. The prospective teacher may feel quite certain that this attitude toward marking will grow rapidly and that within a decade or two education will have discarded the practice of marking. Some plan of recording and reporting school achievement will have been devised which does not prostitute the fundamental purpose of education to satiate the vanity of pupils and parents.

Certain obstacles must be overcome before statements of achievement will replace marks as records of pupil progress. At present the goals of achievement, or units of learning, in secondary schools are not clearly enough defined to be used for the purpose. Thus the first step is that of constructing definite learning units. Care must be taken to make them sufficiently flexible to permit pupil initiative and at the same time sufficiently clear-cut and unified to be recorded as steppingstones of pupil progress. The division of the present volume which treats the problem of the learning unit attempts to offer suggestions to facilitate the construction and use of such learning units.

Various schools in different parts of the country have been leaders in using progress statements instead of marks. Billett reports as follows for one school system :

In the high school at Faribault, Minn., the work in geometry is being presented by means of unit assignments. A mimeographed report to parents lists the units of the course and gives the date on which the pupil masters each unit. Space is provided for remarks concerning the pupil's progress.¹

Subsequent inquiry at the Faribault schools by the present writer revealed that the plan had been extended to other branches of mathematics.

¹ Ibid. p. 448.

The mimeographed general-progress report for the students in higher algebra, for example, lists the operations to be mastered, spaces for the dates as the mastery is attained, and a column for remarks by the teacher. Although the idea has not yet been extended throughout the school, plans are in progress for its use in instrumental music.¹

The problem of reporting achievement in terms of units, or goals, has been studied also by the teachers and school officials at Winnetka, Illinois, for a number of years.² By careful research very definite goals have been set forth in terms of learning units or specific abilities to be acquired by the Winnetka pupils. The goals for several subjects studied by a given pupil are printed upon his "goal card," and a date is entered beside each goal or ability as he achieves or acquires it. As Washburne points out, they give dates instead of marks to their pupils. The first goals which a child should attain are printed at the bottom of the card, and each six weeks a red line is drawn across the card connecting the highest goals completed in the several subjects. A dotted line is printed across the card to indicate the point which the average child of the given grade should attain in six weeks. Thus the parents, each six weeks, are able to compare their child's progress with that of the average child in his grade. This Winnetka technique has been adopted rather widely in elementary schools but has thus far made little progress in secondary schools except in the more progressive systems, because the goals and abilities to be achieved in secondary schools have not yet been clearly enough defined.

A second obstacle to the use of actual progress records instead of marks is the desire of pupils to win marks and the desire of parents to have marks won by their children. This obstacle will disappear elsewhere as it has at Winnetka as parents and children see the greater value of the achievement-record system of reporting school progress.

Informal letters to parents. Billett³ reports several unique practices which have replaced marks in various schools. One method of reporting to parents that has much in its favor is the practice of sending them informal letters. The letters may be written either by the teacher or by the pupil. Some letters stress good work, while others point out weakness. A sample submitted to Billett by the Girl's Vocational School of Minneapolis is as follows :

Dear Mother :

I am sending home this letter for you to read, to find out how I am getting along in my school work.

¹ In reporting this development the writer acknowledges the courtesy of Superintendent C. W. Cross and Mr. C. E. Purdie, former teacher of mathematics, Faribault, Minnesota, both of whom were instrumental in adapting the technique for secondary-school use.

² See Carleton Washburne, *Adjusting the School to the Child*, pp. 164-168. World Book Company, 1932.

³ Op. cit. p. 450.

During this term I have not been tardy but have been absent three times.

My health is good but I need glasses to make everything perfect.

Since school has started I have worked 8 days $3\frac{1}{2}$ hours and have earned 18 dollars 18 cents. The type of work I have done in stores is wrapping. I must be perfect in health in order to be a good prospect for the store.

My work is satisfactory. Miss D—— says I am outstandingly good in Textiles.

As a working prospect I would be better if I improved my English, and got a pair of glasses.

Your loving daughter,

E. M.

We find E. to be dependable, a willing worker, and a pleasant child.

D. V. D. (teacher)¹

Reporting progress in groups of different ability levels. Many schools with sufficiently large enrollments divide the pupils into sections according to ability. Pupils above a specified scholarship record and intelligence rating are placed in one section, those of average ability are placed in a second section, and those below a specified mark are placed in a third group. In other schools, such as those which use the group-study plan described in Chapter VII, pupils within a single section or class are grouped according to their ability and pursue different levels of work although in the same room.

In either type of ability grouping the question of recording and reporting achievement arises. Should the same percentage of A's be given to the low group as to the high group, if marks are used? Three answers have been given to the question in various schools. One answer is in the affirmative. It is based upon the argument that pupils should be judged by the honest effort they put forth as well as by the scholastic level they attain. If our social order were based upon this kindly philosophy, perhaps such a scheme would be sound; but in a realistic world it is vicious. It gives the pupil a distorted sense of values and leads to very bitter disillusionment when the adolescent finishes school and meets the standards of efficiency required for success in the ministry, in law, in business, in teaching, or in any other important vocation. It is probably true that many persons who achieved high marks in school largely through the indulgence of the teachers have met failure despite their best efforts after finishing school. Such persons feel that society has wronged them. They may seek refuge in the other-worldliness of certain religious denominations and become reconciled, or they may take less socially desirable courses to retaliate against the imagined abuse. If there is any truth at all in this line of thought, it would seem wrong to give high marks to any pupil who has not achieved them.

¹ Ibid. p. 451.

The second answer to the question seeks to dodge the issue by giving about the same percentage of A's to each group but designating them by group with a symbol of some type. Thus in schools which assign the letters X, Y, and Z to their high, middle, and low groups, respectively, grades with the groups designated would appear as A^x, A^y, A^z, and so forth for each mark. The writer questions the therapeutic value of this palliative. The scheme lessens the immediate shock, but the distorted sense of values remains.

The only sound method of distributing marks in ability groups, if marks there must be, is to give each pupil the mark his achievement merits. If some pupil in the lowest-ability group actually attains the level set for the highest mark or if he does as well as the best in the highest group, he should be given an A. But under no other condition should he be given the A. And in a similar just manner the best pupil in the highest group should be given an A only when he earns it.

The whole controversy about marking in ability groups may be avoided by the use of goals instead of marks. The controversy serves the very good purpose of exposing the fallacy of the idea of giving marks for school achievement. It quite clearly shows that any plan of marking inevitably leads pupils and parents to interpret education in terms of marks rather than in terms of pupil growth. The dated achievement of definite goals, as revealed by reliable measurement, emphasizes specific abilities as outcomes of learning. Such goals, instead of marks, eventually will be used to record pupil growth.

Evaluation

The scientific movement in education has challenged both what the schools teach and how they teach it. The era of complaisant faith in untested traditional content and obsolete method has passed. This does not imply that the old is bad; instead, it means that both old and new must stand the test of evaluative research and that only the good should survive.

Evaluation is the term in education that has been applied to all processes that seek to measure the value of *objectives*, to measure the effectiveness of various *procedures* or *experiences* designed to help pupils attain their own objectives and those set for them by society, and to measure *pupil progress* toward objectives considered or proved to be valid. Thus the term is very broad in its meaning. It includes not only the appraisal

efforts of teacher, supervisor, and administrator to refine their aims and their practices or to promote pupil progress; it also includes the pupil's own efforts at self-appraisal.

It is immediately apparent that most of the contents of this chapter and the preceding chapter are fundamental to the problem of evaluation. That is to say, measurement is essential to evaluation. The person who wishes to evaluate uses measurement as a tool. Thus mental tests may be used to evaluate growth in mental age, while tests of special aptitudes, attitudes, personality and character, and appreciation may serve to evaluate growth in the various characteristics involved. All standardized tests may be used to evaluate the growth pupils make in knowledge of the various fields of learning, while the informal classroom tests are somewhat less reliable tools for the same purpose. The techniques for grouping test scores and presenting them graphically, the measures of central tendency such as the mean and median, and the measures of variability such as the range, the quartile and standard deviations are all used in evaluating the work of pupils in terms of absolute growth toward desired objectives or in terms of relative progress when pupils are compared with each other or with other groups of the same stage of development. The survey method may be used in evaluating the progress made over a period of years between an initial and subsequent survey in any aspect of the educational program, while the experimental method is the best procedure yet devised for appraising classroom procedures with a view to selecting the best. Finally, it is entirely obvious that any means used in reporting pupil progress is an index that has resulted from some kind of evaluation of the pupil's progress.

The chief purpose of the present section is to give the novice and experienced teacher alike the opportunity to gain further insight into the problem of evaluation as it is being attacked in the modern school. Several illustrations will serve this purpose. In each illustration an attempt has been made to use nontechnical language.

The Evaluation of Objectives

Of the three aspects of evaluation included in the definition above — evaluation of the validity of objectives, evaluation of the relative effectiveness of procedures or experiences, and evaluation of pupil progress — the one which seeks to test the value of objectives is the most difficult in operation. In fact not all persons will agree that it is an aspect of evaluation. Some will maintain that the choosing of objectives is a function of

philosophy and is not to be subjected to research or the findings of research. But others hold that the values which philosophy sets forth as objectives have arisen from the experience of the race and that careful historical and sociological research is essential for an accurate description of that experience. Furthermore, educational values or objectives that do not consider the sciences of biology or psychology would only by chance be attainable. Consequently the objectives set for the school must be evaluated in the light of scientific findings that have resulted from rigorous application of the tools of measurement. Philosophical pronouncements for education that have not been subjected to such critical evaluation are not to be trusted.

Few illustrations are available of attempts to check the validity of objectives. Spencer, whose general purpose of education as analyzed in terms of activities of life¹ set the pattern for the cardinal principles of secondary education² and subsequent statements of purposes of education, though not regarded by himself or others as a scientist, was unquestionably influenced by his friends Darwin and Huxley. His work on psychology preceded that on education and therefore influenced his thinking in the field of education. Thus it is not unreasonable to assume that he, in setting forth his objectives of education, constantly checked his thinking against the best scientific knowledge of his day. Dewey, in his experimental school, spent ten years testing the validity of his educational theories. Upon this foundation he later based his objectives of education.³ While it is true that few of the now current techniques of critical educational research were available to Dewey in his formative years, it is also true that he used the best methods of evaluation then available in testing the validity of his purposes as well as his practices.

A more recent attempt to set forth valid objectives is the work of the Educational Policies Commission.⁴ The volume is the product of seven conferences over a period of three years in which leaders in various fields of education sought to select those purposes which would be valid in the sense of attainability within the limits of human nature and in the sense of appropriateness to our evolving culture. Before announcing the purposes, the groups subjected their thinking to findings of historical, psychological, and educational research. That is to say, the evaluative

¹ See page 25, above.

² See page 30, above.

³ See page 26, above.

⁴ *The Purposes of Education in American Democracy*. Educational Policies Commission, National Education Association and American Association of School Administrators, Washington, D.C., 1938. See page 34, above.

processes that can be used in advance in determining the probable validity of objectives were used during the three years prior to the final statement of the purposes.

In the long run, time will tell whether or not these or any other purposes have been valid. The real test of the value of objectives is the periodic check of results. The purposes set forth by the Educational Policies Commission will have been valid if, after ten or twenty years, critical educational and sociological research reveals an improved nation as the result of greater self-realization on the part of the individuals in the nation, better human relationships, greater economic efficiency, and a more effective sense of civic responsibility.

Thus, with respect to the evaluation of objectives, it may be said that while some evaluative processes may be used in advance of the pronouncement of the objectives, the more fundamental evaluative processes must follow a period of trial. Such processes differ from those described in the following sections only in application. They are alike in nature. Therefore, for further understanding of the nature of evaluative processes, the student is referred to the illustrations which follow.

Evaluation of Procedures and Experiences

In the past, little effort was given to appraising either the teacher's methods of instruction or the child's experiences in learning. Teachers taught as they had been taught and used textbooks with little thought of measuring their effect upon the learner. Now the teacher is expected to understand the appropriate processes of evaluation and to apply them both to his own activities and to those of his pupils. The task is thus twofold. Let us consider first the evaluation of teaching procedures and then the evaluation of pupil experiences with the materials of learning. The two aspects of the problem may be thought of as the evaluation of instruction and the evaluation of curriculum.

The experimental method described on pages 409-416, above, is an illustration of the evaluative process to be applied to instructional procedures. Numerous experiments similar to the one described have been conducted by teachers and other research workers in recent years. The findings are available to the teacher in every field of elementary and secondary teaching. For example, Curtis has summarized the findings of research in the field of science.¹

¹ Francis Curtis. *Third Digest of Investigations in the Teaching of Science*. P. Blakiston's Son and Company, Inc., 1939. xvii + 419 pages.

In each experiment the essential features are the same: two or more groups of pupils of equivalent ability, maturity, and knowledge of the subject are tested at the outset of the experiment with reliable tests for the given field of study; one group, called the control group, is taught according to specified procedures, usually the procedures to which the teacher is accustomed; an experimental procedure is used in addition to or instead of the customary procedure for the other group or groups; so far as it is possible to do so, the same amount of time is spent by the pupils in the control and experimental groups; after a specified time, the test is repeated with both or all groups; the difference in gains made by the groups is subjected to the statistical procedures described above to determine whether or not the differences are significant.

This general evaluative process is not limited to measuring achievement in knowledge of subject matter. It is equally applicable to all other outcomes of learning for which reliable instruments of measurement are available or can be constructed. For example, the writer conducted a five-year series of experiments in independent study in which attitudes toward learning were measured in addition to subject matter.¹ Incidentally, in these experiments it was discovered that the independent-study groups, as compared with the control groups, achieved as well in subject matter and developed better attitudes toward learning.

The thoughtful reader may be wondering whether or not all methods of instruction in the various fields have already been subjected to this type of evaluation, and he may have concluded that it would be necessary for him only to become acquainted with the findings. Unfortunately such is not the case, because the best procedure for one teacher may not be the best for another and because new procedures and new materials are being devised which have not been critically evaluated. On the other hand, some findings may be universally accepted, such as those reported above in the chapters on visual education and the radio. Therefore the sensible approach for the teacher to make is to acquaint himself with the findings in his field that can be used with confidence, and to use the experimental procedure in evaluating other procedures of promise.

The evaluation of the curriculum or of the experiences of pupils differs from the evaluation of instruction largely because of the nature of the experimental factors involved in the two types of evaluation. Whereas

¹ J. G. Umstatt, "Student Attitude toward College Practice," *Abstracts of Papers at the St. Louis Meeting, The National Society of College Teachers of Education*, 24: 29-31. Studies in Education. The University of Chicago Press, 1936.

in the evaluation of instruction the experimental factor is something the teacher does, in the evaluation of pupil experience or curricular materials the experimental factor is something the child does or something he uses. The difference between the two types of evaluation almost disappears in some experiments. For example, it would be difficult to say whether certain experiments with visual aids are evaluations of instruction or evaluations of curriculum, because visual education is a method that carries its own materials. In other experiments the line between instruction and curriculum may be more clearly defined. For example, a number of experiments have been conducted to determine whether certain desired outcomes in language arts are attained better by intensive reading than by extensive reading. Here the evaluation is largely of pupil experience or curricular materials.

In considering the evaluation of experience or curriculum, two fundamental points should be borne in mind. First, the purpose is to discover which experiences or which materials are most effective in causing pupils to attain the desired objectives. Second, the techniques of experimentation may be used to achieve this purpose. When compared with these two points, the question of the degree to which instruction is involved in a given curricular experiment, or vice versa, is relatively unimportant.

One type of curricular evaluation deals with the problem of the placement of materials or experiences. The question in this type of study is *Where?* rather than *What?* Such studies seek to determine the grade or maturity level at which certain abilities and skills in reading or arithmetic, for example, can be gained most effectively. The evaluation of results from similar experiences at each of several levels is the general technique employed in seeking the solution for this problem. Incidentally, the findings of such studies have in general been more satisfactory in the elementary school than at higher levels. It may be noted that in placement studies the scope is limited to small amounts of content or to narrow experiences, and, so far as it is possible to do so, the same procedures are used in all groups within the given evaluative experiment.

Another type of evaluation of instruction or curriculum, or both together, embraces large parts of the school program. Three outstanding illustrations are the Eight-Year Study of the Progressive Education Association, the Southern Association Study, and the *Evaluative Criteria* that were developed by the Co-operative Study of Secondary School Standards.

One of the purposes of the Eight-Year Study was to discover whether or not graduates of modernized high schools could equal in college the

records of graduates of traditional high schools. Thirty high schools in various parts of the United States were selected as the modern schools or as schools that desired to become modern in their curricular and instructional programs. They were referred to as schools "freed from the shackles of college entrance requirements." More than three hundred colleges agreed to co-operate by permitting graduates of the thirty schools to enter college without the pattern of high-school subjects usually required for entrance. During the next few years the programs were altered in varying degrees in the thirty schools. In October, 1939, a general report was issued¹ which compared the college performance of 1472 graduates of the thirty schools with that of 1379 graduates of schools that had been selected as "comparison" schools. Prior to the comparison of college success, each graduate of the thirty schools who entered college had been paired with a graduate of the same sex, age, and race from a comparison school who likewise had entered a college. The two students in each pair were also similar in respect to scholastic aptitude, interests, size and type of their home community, and socio-economic status of family.

Two kinds of comparisons were made of the pairs in college: marks in college subjects, and other aspects of living in college. In the comparison of marks, for the graduates who entered college in 1936, those from the thirty schools made the higher averages in more subjects as freshmen, sophomores, and juniors than did the students with whom they had been matched from the comparison schools. For example, those from the thirty schools had higher averages than the others in the freshman year in English, social sciences, biological sciences, physical sciences, and mathematics; while the others had the higher averages in foreign languages and the humanities. Results almost identical to those just noted were obtained as freshmen and sophomores in the comparisons for the graduates who entered college in 1937, while those who entered in 1938 from the thirty schools had higher averages than the others in every college field pursued during the one year for which data were available. From a statistical standpoint, in few cases were the averages for one group significantly different from those for the other group, in any of the comparisons, but the differences were more often in favor of the students from the thirty experimental schools.

¹ Ralph Tyler and staff, *General Report on the College Performance of the Thirty Schools and the Comparison Schools*. Progressive Education Association (Stencils), 3039-3050, The University of Chicago, October, 1939. See also Wilford M. Aikin's *The Story of the Eight-Year Study*. Harper & Brothers, 1942.

The comparisons of other aspects of living while in college reveal even more striking differences in favor of the "S group," the group from the thirty schools. These differences are summarized as follows:

The members of the S group, when compared with a similar group from other schools, have not only achieved grades of at least equal caliber, but also participate more frequently in campus activities, show a greater interest in contemporary affairs, participate as freely in social life, and have a broader range of interest in aesthetic experiences, both creative and appreciative. At the outset at least, they have an advantage over their fellow-students by reason of having less trouble with the study skills and with organizing time. There seems to be no difference in the frequency of problems in the area of personal-social integration.¹

These results are from only one of the evaluative processes used in the Eight-Year Study, the one which best illustrates the large-scale type of evaluation. Other processes will be mentioned below, and still others may be found in the final reports of the Study.

The second illustration of evaluative processes used for entire school programs is the Southern Association Study launched in 1938 by the Commission on Curricular Problems and Research of the Southern Association of Colleges and Secondary Schools. The general purpose of the Study was to improve education in the South. At the outset it was decided not to follow the usual procedure of setting up experimental and control schools but instead to engage in a series of studies in several secondary schools. Of this decision the following statement is made in the first progress report:

It marks the beginning of one of the fundamental assumptions underlying the Study; that is, that the most effective way to bring about educational improvement is for the individual school to plan in terms of its own needs and the nature of its community.²

Following its decision not to use experimental and control schools, it was necessary for the staff of the Southern Association Study to devise new processes of evaluation to apply to the programs of the thirty-three co-operating schools. The purpose of the processes was to appraise the school's development in its ability to serve the needs of its youth and its community. Aspects of the problem which were attacked included better

¹ Ralph Tyler and staff, *General Report* (Stencil), 3044.

² Frank C. Jenkins and staff, *The Southern Association Study, A Report of the Work with the Thirty-Three Co-operating Secondary Schools, 1938-1941*, p. 2. The Commission on Curricular Problems and Research of the Southern Association of Colleges and Secondary Schools, Nashville, Tennessee, 1941. 68 pages.

teaching through increased emphasis on relating subject-matter content "to the experiences and concerns of pupils"; more fundamental purposes, such as "critical thinking, group co-operation, independence in study, and mastery of essentials"; "improved administrative procedures" to support the improved teaching procedures; "more effective teacher-pupil relationships"; and "more satisfying teacher-pupil-parent relationships." Other aspects of the problem of measuring the school's growth dealt with community improvements in such matters as the care of the handicapped, health and nutrition, recreational facilities, and general economic status.

Thus the main point in the Southern Association Study was not to determine how well a school does in comparison with other schools. Instead, it was to determine how well the school performs its own task of serving the needs of its youth and the needs of its community. To appraise the school's success in this task, a record was made of experiences of teacher, pupil, parent, and community that resulted from the effort of the school in various aspects of its obligation to pupil and community. Such evidence of progress soon became available for many of the schools. In various communities the handicapped were receiving better care than before the Study began, health conditions had been improved, nutritional problems were being solved, pupils were using what they learned to improve the economic conditions of their communities, friction between pupil and teacher and between school and home diminished, — in short, the evidence was clear that the schools were serving the needs of the youth and the needs of the community.

The staff of the Southern Association Study was faced with the concern on the part of some teachers and parents that some of the learnings ordinarily sought in such fields as mathematics and languages might suffer under the newer procedures. This called for such usual evaluative procedures as the comparison of standardized-test scores of graduates with state and national norms, and similar comparisons for graduates of succeeding years. Such comparisons were made in English, Contemporary Affairs, Mathematics, Language Usage, Vocabulary, Latin, and other areas of knowledge. The result of the comparisons is reported as follows:

These statistics, based upon small numbers of cases and with numerous variables uncontrolled, are not highly reliable; but an accumulation of such findings leads to the almost certain conclusion that informational learning and the skills commonly sought in schools do not suffer as a result of the kinds of

changes that have been and are being made in the Southern Association Study. Actually in a large majority of the cases where anything like comparable data are available the schools of the Study make somewhat higher scores on such tests.⁴

Enough has been presented from the Eight-Year Study and the Southern Association Study to reveal to the reader some of the processes used to evaluate curricular materials and instructional practices of wide scope.

The third illustration of large-scale evaluation reveals additional appraisal devices for entire school programs. It is the *Evaluative Criteria* developed by the Co-operative Study of Secondary School Standards as a yardstick to measure how well a secondary school is achieving its objectives. This instrument includes standards selected from research findings of numerous investigations in secondary education and from the writings of persons considered authorities in that field. The standards are set forth for nine aspects of the secondary-school program: curriculum and courses of study, pupil-activity program, library service, guidance service, instruction, outcomes, school staff, school plant, and school administration. For each of the nine phases of the program, the standards consist of a series of statements each of which involves a condition or a provision considered desirable for a secondary school by the authoritative research and literature in secondary education. In using the criteria, a school appraises itself against eleven hundred such statements for the nine aspects of its program. Beside each statement the school inserts a plus sign if the provision or condition is present or made to a very satisfactory degree, a minus sign if it is present to some extent or only fairly well made, a zero if it is not present or is not satisfactory, or the letter *N* if the condition or provision does not apply.

Upon the basis of the symbols given for each subdivision of the criteria, and upon the basis of the school's knowledge of how well the condition or provision exists in schools affiliated with the regional accrediting association in which the school is located, the school assigns itself several numerical values ranging from 5 to 1 for each subdivision of the statements. The numerical values are then translated into percentile scores from tables of norms previously derived by the Co-operative Study. The following excerpt from the pupils' activities section of the *Evaluative Criteria*, page 42, illustrates the plan:

⁴ Frank C. Jenkins and staff, *The Southern Association Study, A Report of the Work with the Thirty-Three Co-operating Secondary Schools, 1938-1941*, p. 60.

THE SCHOOL ASSEMBLY

CHECKLIST (Use symbols, +, —, 0, or N.)¹

- () 1. A school assembly committee is in charge of the general development and organization of the school assembly activities
- () 2. School assembly programs are in large part given by pupils and by pupil organizations with pupils presiding
- () 3. Assembly programs are planned so as to secure participation and contributions of many, not simply of the few
- () 4. Assembly programs have definite entertainment, instructional, cultural, and inspirational values
- () 5. Assembly programs often provide for audience participation by such means as group singing or discussion
- () 6. Assembly programs are free from coarse and objectionable elements
- () 7. Assembly programs are characterized by a variety of presentation, such as music, speaking, devotional exercises, dramatization, demonstration, and exhibits
- () 8. Assembly programs stimulate the creative ability of pupils by such means as encouraging them to write and produce plays or other performances, design scenery and costumes, and devise unusual exhibitions and entertainments
- () 9. Correct audience habits are developed — no late-comers or early-leavers; reasonable applause; courteous attention to performers; no disturbances
- () 10. A definite period and adequate time are provided for the school's assemblies
- () 11. Provision is made for pupil evaluation of presentations
- () 12. The assembly schedule provides for occasional programs utilizing great artists or leaders in various fields of activity
- () 13.
- () 14.

SUPPLEMENTARY DATA

- 1. Number of school assemblies per year.....
- 2. Length of assembly period.....
- 3. Submit copies of four successive assembly programs.

EVALUATIONS (Use numbers, 5, 4, 3, 2, or 1.)¹

- () w. *How adequate are the provisions for attaining conditions or results such as the above?*
- () x. *How effectively are these conditions or results attained?*
- () y. *How actively and extensively do pupils participate in the planning and presentation of programs?*
- () z. *Evaluate the quality of four successive assembly programs.*

¹ The instructions in parentheses were inserted for the purpose of illustration.

Thus by use of the *Evaluative Criteria* any secondary school of any size or type is able to appraise its program in terms of percentile scores. "Temperature" charts are provided in the form of printed thermometer scales on which the percentile scores may be entered as "degrees of temperature" to indicate graphically the school's standing on each of the various phases of its program. Such charts or "thermometers" are provided for one hundred and ten different subdivisions of the school program.

Because most secondary schools in America use the *Evaluative Criteria*, the student is advised to inspect a set. They are available in most college libraries.¹

In concluding this section, it may be said that the Eight-Year Study, the Southern Association Study, and the Co-operative Study of Secondary School Standards, the illustrations of large-scale evaluative processes, are three of the most significant investigations ever conducted in secondary education. Their findings and the processes they developed have contributed much and will continue to contribute more toward the solution of the problems facing the modern secondary school.

The Evaluation of Pupil Progress

Pupil development is the outcome desired in all aspects of the education of children and youth. Broad social objectives are set up with a view to giving the direction to pupil development that will in time result in a better society. More immediate objectives are set forth in terms of better mental health, better subject-matter achievement, more satisfactory personal living, and so forth. In each case the outcome desired is pupil development toward the end implied in the objective.

So it is with curricular content and instructional practices. They too are concerned primarily in promoting desired outcomes in terms of pupil development. The evaluation of curricular content, whether it be from books or within the experiences of pupils, and the evaluation of instructional practices must be in the last analysis the evaluation of pupil progress toward the outcomes sought by the program of the school.

Thus it is clear that the preceding sections on the evaluation of objectives and the evaluation of procedures and experiences are closely related to the evaluation of pupil progress. A number of the evaluative processes

¹ A set consists of the 1940 editions of three publications by the Co-operative Study of Secondary School Standards, Washington, D.C.: *How to Evaluate a Secondary School*, 139 pages, 90¢; *Evaluative Criteria*, 175 pages, 60¢; and *Educational Temperatures*, 124 pages, 50¢.

described above have involved the measurement of pupil progress. The present discussion will therefore be limited to illustrations of evaluative processes designed primarily for the appraisal of pupil progress, although it should be clear that they might also be used in any fundamental approach to the problem of evaluating any phase of the school program.

The school is interested in four general types of pupil development — the physical, the mental, the social, and the emotional. The social and the emotional include, among other phases of living, the traits, attitudes, and appreciations usually associated with the spiritual and with character development. Thus the four types of development embrace all aspects of living and involve the development of a multitude of skills, habits, knowledges, ideals, attitudes, tastes, appreciations, and traits. The problem of evaluation of pupil progress, then, becomes that of measuring the progress the pupil makes in each aspect of living, so far as it is possible to do so. The purpose of this section will be served by one illustration from each of the four types of development. The student should understand that evaluation will be a problem for his constant study as long as he teaches.

One of the many aspects of physical development is motor ability. A specific skill within the wide range of motor ability is illustrated in Brace's test for shooting basketball baskets, considered one of the earliest printed tests of this sort. The test is as follows:

The subject stands behind a line formed by extending the foul throw line to the left to intersect the arc of the free throw line on the left side, facing the basket. Ten tries allowed and the "push shot" must be used. Two points are scored if the ball goes through the basket. One point is scored if the ball does not go through the basket but strikes the rim of the basket before hitting the backboard. The highest possible score is twenty points.¹

By use of this test at intervals the pupil's progress in the skill needed for shooting baskets may be charted with accuracy. Brace² developed five other tests for various aspects of basketball, four for playground baseball, four for soccer football, and others to measure more fundamental motor abilities. Together they provide the measuring instruments for the evaluation of pupil development in their respective phases of physical education. Parallel with such evaluative processes of physical skills, there should be kept for each child throughout his twelve years in

¹ From *Measuring Motor Ability — A Scale of Motor Ability Tests*, by David Kingsley Brace. Copyright 1927 by A. S. Barnes and Company. xvi + 138 pages.

² *Ibid.* pp. 73-83. See also C. H. McCloy. *Tests and Measurements in Health and Physical Education*. F. S. Crofts & Co., 1939. 392 pages.

public school a complete health and physical growth record. Some of the items included should be the results of periodic medical examinations; yearly size and weight measurements; and record of illness, accidents, and physical disabilities.¹ Such an array of data enables the school to chart the pupil's bodily development and to safeguard and promote his health. From the standpoint of evaluation, it enables the school to measure its success in these important aspects of its program.

Similar processes are used in the evaluation of the pupil's development in mental abilities; that is to say, both tests and cumulative records are employed. Mental tests are used to measure development toward mental maturity, and standardized or teacher-prepared objective tests are used to appraise growth in knowledge of subject matter, in skill in the use of the library, in ability to apply principles, and in other aspects of mental work. A general discussion of mental, subject-matter, and other tests of similar nature is presented in the preceding chapter. The use of one specific test as a measure of pupil development in a mental skill is discussed below in conformity with our present purpose.

The test selected for the illustration is one on the ability to interpret data.² The test consists of ten presentations of data in the form of graphs, tabulations, or statements of procedures and results. Following each presentation of data are fifteen statements of varying relevancy to the data. The student indicates beside each statement whether, from the data alone, it is true, probably true, false, probably false, or not sufficiently related to the data either positively or negatively to be judged either true or false. By administering this test before and after a course for which the ability to interpret data is a definite objective, the teacher measures the growth each student makes in the ability.

In recent years increasing stress has been placed upon recording pupil progress in mental skills and intellectual pursuits by keeping informal records of his ways of working, his newly developed interests, his reactions to various school situations, his experiences outside of school, and other aspects of his living that might be indices of development. Many persons have much confidence in this method of evaluation, because it gives a fuller account of the pupil's experiences than is usually available from formal tests and because it is derived from more normal life situations than the one that is present when tests are being given. This aspect of

¹ McCloy, *op. cit.* chapters 18 and 19.

² *Test 2.51: The Interpretation of Data.* Progressive Education Association, Evaluation of the Eight-Year Study, University of Chicago Press, 1939.

the evaluation of pupil progress is closely related to the case-study and other techniques described in Chapter III.

Less has been done in the evaluation of social development than in the case of either physical or mental development. By social development is meant less the acquisition of the facts of history, sociology, economics, and other social studies than the ability to use these facts in the solution of the student's own social problems. Primarily, social development means the growth in such social skills as co-operation and courtesy, in such ideals as altruism and love of country, and in such personal qualities as social sensitivity and good will. Evaluative devices for the measurement of pupil growth in such traits and skills include attitude scales, performance tests in which the pupil carries out given social acts, and anecdotal accounts of behavior from time to time in social situations. For example, one class developed its own plan for judging the development of the ability of its members to introduce unacquainted persons to each other in various situations. The introduction was made for each situation, before the class, after the given situation had been described, and the score of errors was kept until all had learned to make the introductions without error in the various situations.

The attitude scale mentioned above ¹ illustrates the use of the scale in measuring student development toward an appreciation of the meaning of scholarship. Similar scales may be constructed for any attitude the teacher or group may wish to develop during a given series of school experiences within or outside the classroom.

Evaluation in the realm of the emotions includes the measurement of the growth of the pupil toward emotional maturity and the detection of symptoms of emotional instability. In both aspects of the problem, the testing approach has value,² but other approaches appear to be more effective. Among the other approaches are the case study, the interview, use of personal records, critical study of an autobiography prepared by the student,³ and the use of the anecdotal journal.⁴

¹ J. G. Umstatt, "Student Attitude toward College Practice," *Abstracts of Papers at the St. Louis Meeting, The National Society of College Teachers of Education*, 24: 29-31. Studies in Education. The University of Chicago Press, 1936.

² John G. Darley, "Tested Maladjustment Related to Clinically Diagnosed Maladjustment," *Journal of Applied Psychology* (December, 1937), 21: 632-642.

³ See *Review of Educational Research*: Vol. XI, No. 1 (February, 1941), "Psychological Tests and their Uses," and Vol. IX, No. 2 (April, 1939), "Pupil Personnel, Guidance, and Counseling."

⁴ L. L. Jarvie and Mark Ellingson, *A Handbook on the Anecdotal Behavior Journal*. The University of Chicago Press, 1940.

It should be quite clear that a considerable background in psychology or even clinical experience is essential to the proper use of the tests and other techniques named above. They are mentioned at this point more to acquaint the reader with current attempts at evaluation in the field of emotions than to suggest their immediate use by the novice. However, the procedure selected for illustration, the anecdotal journal, may be of considerable value to the beginning teacher as well as the teacher of special training in his attempt to study the growth of his pupils along non-subject-matter lines.

The anecdotal journal has been defined as

a day-to-day record which provided a cumulative body of evidence relating to the habits, ideas, and personality of individuals as these were manifested through overt behavior. Specific entries in the Journal, described as anecdotes, were composed of objectively recorded behavior incidents, which reflected some significant item of conduct, gave a word picture of the individual in action, provided a snapshot at the moment of the incident, or recounted any event in which the student took part, in such a way as to reveal significant aspects of his personality.¹

Sample entries in the teacher's journal are as follows:

- C. C. T. Seems somewhat timid and stopped after class early in the course to ask particular questions about the form her notes should take.
- E. B. H. Discussed her prospective job at ——. Asked if she could get placed in larger store next year.
Seems to speak "thru her nose." Doesn't enunciate clearly.
- D. D. Seems to find it difficult to mix with other students. Appeared surprised when invited over to drug store for "coke." Didn't know quite what to do and fumbled around in accepting the invitation. Finally went along.
- J. M. S. Came in promptly to arrange for assignments missed during absence. Kept early assignments up-to-date and worked ahead so has very little to make up. Appreciative of conference work.
- A. M. J. She is a very conscientious, hard worker. She is inclined to demand considerable attention or perhaps it is not that so much as the fact that the tone of her voice, which is somewhat monotonous, makes one notice each time she speaks.²

Values claimed for the journal technique were summarized by Traxler³ and quoted by Jarvie and Ellingson (page 8).

¹ Ibid. p. 1.

² Ibid. p. 2.

³ Arthur E. Traxler, *The Nature and Use of Anecdotal Records*, Supplementary Bulletin D, pp. 21-23. Educational Records Bureau, New York, January, 1938.

1. They [anecdotal records] substitute specific and exact descriptions of personality for vague generalizations.

2. They relieve individual teachers of the responsibility of making trait ratings and provide a basis for composite ratings. Moreover, they provide a continuous record while trait ratings are usually made only at certain points in a pupil's school experience.

3. Personal relationships between the pupil and the counselor are improved by anecdotal records, for these records show the pupil that the counselor is acquainted with his problems.

4. Anecdotal records aid in the formulation of individual help programs and encourage active pupil participation in remedial work.

5. They show needs for the formation of better work and study habits and also provide encouraging evidence of growth in these respects.

6. An appropriate summary of anecdotes is valuable for forwarding with a pupil when he is promoted to another school.

7. The qualitative statements contained in anecdotal records supplement and assist in the interpretation of quantitative data.

8. Collections of anecdotal records may provide the necessary validating evidence for various evaluating instruments. For instance, when the results of the Bernreuter Personality Inventory indicate that certain pupils are high in dominance and others are low, the anecdotal record materials for these pupils may be analyzed to find out whether or not the Bernreuter scores agree with the observations of behavior.

9. Anecdotal records aid in clinical service. When pupils are referred to clinical workers for special study of their problems, there is great advantage in having anecdotal records available for these highly trained workers to interpret.

While it is true that keeping an anecdotal record is time-consuming, the procedure unquestionably provides the teacher with data not available from any other source. When kept for a given pupil month by month throughout a period of years, indices of his emotional stability or instability may be detected from time to time, and a fairly complete picture of his emotional development is available for study with a view to facilitating that phase of his growth. The procedure has been treated at some length; but, even so, the student is advised to refer to fuller treatments. Proper use of the anecdotal journal will not only assist in the evaluation of pupil progress; it will also promote the kind of pupil adjustment that will make for normal, wholesome development of all aspects of the pupil's being.

The discussion of the evaluation of pupil progress has included illustrations of devices for the evaluation of four types of development — physical, mental, social, and emotional. It should be clearly understood that the division into types was for purposes of analysis only. The types

represent the four general aspects of life, and while one aspect may be uppermost at a given moment, the four are always intricately interwoven and constitute the vital processes of the individual. Consequently, in the appraising of pupil progress, the results obtained from the four types of evaluative devices should be placed together as a whole in the attempt to get a complete picture of the individual's growth.

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DIVISION IV

Associated Activities of the Teacher



CHAPTER XVI · Extra-instructional Activities in School
and Community

CHAPTER XVII · Self-analysis and Professional Im-
provement



CHAPTER XVI • Extra-instructional Activities in School and Community

GENERAL VIEW OF THE CHAPTER

Purpose of the Chapter
Home-Room Advisership
Class Sponsorship
Instructional Supplies
Attendance and Class Records
So-called Extra-curricular Activities
Committee Membership
Staff Relations
School Spirit
Social Affairs
Special Occasions
Buildings and Grounds
Parent-Teacher Relations
Community Contact
Selected References for Further Study

Purpose of the Chapter

THE first three divisions of this volume treat various classroom problems faced by the teacher. Division I gives the underlying principles related to the objectives of teaching, to knowing the learner, and to facilitating pupil progress through proper adjustment and stimulation. Division II sets forth the principles and practices of the unit idea in teaching. Division III deals with problems of planning the learning exercises, using visual aids and the radio in teaching, and measuring pupil potentialities and pupil progress. An understanding of the classroom problems discussed in these three divisions is essential to successful teaching. It is possible, however, for a teacher to understand the purely instructional problems and still be a dismal failure because of his ignorance of or disregard for certain associated activities. Many of these problems have such an important bearing upon classroom work that they are sometimes not only a critical factor in the teacher's work but also a deciding factor in his tenure.

The teacher's nonteaching, or extra-instructional, activities are varied and numerous. In a single chapter it is possible only to emphasize their importance by presenting them in generalized form, and to refer the interested student to more detailed sources of information. The purpose of this chapter, therefore, is simply to acquaint the prospective teacher with the main extra-instructional problems, with a view to emphasizing their importance.

At the outset of the discussion one point should be made quite clear. Of the two major types of teaching activities — the instructional and the noninstructional — the instructional are the more important. Only in rare cases should instructional activities be sacrificed to give the teacher more time for the noninstructional. Furthermore, every teacher should conserve his energies for his classroom work rather than yield too freely to the various school and community calls for nonteaching service. The secondary-school teacher is employed primarily to guide the adolescent child through those activities which have become well established as desirable experiences. Many pupil experiences lead outside the four walls of the classroom and still remain purely instructional. To such activities the teacher is justified in giving freely of his energies. Caution should be exercised with activities that are not mainly instructional. It is with such activities that the teacher runs the risk of dissipating his energies, especially when he feels flattered at being called upon to serve in seemingly important capacities. While remembering that his most important function is to teach, however, he should willingly contribute his just share of time to important nonteaching duties.

The noninstructional, or extra-instructional, activities may be classified in two general types: those which are confined to the school, and those which are outside the school. The teacher is obliged, usually by contract, to assist with the nonteaching duties within the school, and is usually expected to lead in or to help with at least one activity outside the school. The nonteaching duties within the school are treated first in the following discussion.

Home-Room Advisership

In most secondary schools each pupil is assigned to a home room,¹ to which he reports each morning before classes begin and at other stated times. A teacher is assigned to each room as the home-room adviser and

¹ Students familiar with the platoon system of school organization should not confuse the term "home room" as used in this section with the home room of the platoon school.

has the entire group under his direct advisership. The number of pupils in a home room ranges from a very few to forty or fifty in the average-size secondary school and several hundred in large-city secondary schools. In the group of 336 schools studied by Koos and Kefauver¹ the proportion of teachers acting as home-room advisers ranged from 10 per cent to 100 per cent. Even beginning teachers are sometimes assigned home rooms.

The home-room adviser is charged with the responsibility of caring for the noninstructional needs of his home-room group. The number and the kind of needs which are discovered and met by the home-room adviser depend upon the enthusiasm and sincerity of the teacher as well as upon his experience and technical skill in guidance. Some "advisers" in poorly organized schools may be satisfied with a perfunctory roll call each morning. Others will be content with nothing less than systematic diagnosis and thorough treatment of the personal, educational, and social needs of each pupil in their groups.

The classroom teacher in a typical school who has five or six classes a day and a total of at least eighty different pupils faces a gigantic task when he attempts to learn all the traits and needs of each pupil and to vary his classroom work in accordance with those traits and needs, as described in Chapter III. The difficulty is even greater in the large secondary school, in which some teachers face as many as two hundred different pupils daily. It is almost impossible to teach in this manner under the present crowded conditions in the public schools. Classes are too large, and each teacher has too many different classes on his daily schedule for the most effective teaching, however zealously he may strive toward what he conceives to be ideal teaching. Until the class-recitation system is abandoned in favor of a system similar to the one proposed in this volume, much of the guidance work which should be a part of every teacher's classroom activities must necessarily be carried on outside the classroom, if at all. During the present era in our public schools much of the work in personal and educational guidance is delegated to the home-room adviser.

As a result of this situation the teacher while acting as home-room adviser can often approach more nearly the ideal in teaching than when actually in charge of a class. It is in the capacity of adviser that he finds the time for personal conferences on matters of vital importance to adolescents under his charge. For example, as adviser he often learns of diffi-

¹ Leonard V. Koos and Grayson N. Kefauver, *Guidance in Secondary Schools*, p. 553. The Macmillan Company, 1932.

culties which confront the pupil at home, such as various aspects of poverty, broken homes, serious illness in the home, or other equally distracting conditions. Under present conditions he often has a better opportunity as home-room adviser than as classroom teacher to discuss vocational plans with the pupil and to relate the pupil's abilities to his plans for the future. Much of the advice will be in answer to questions about subjects to be taken in subsequent years or about plans for college. As adviser he is sometimes required to know how the pupil's work is progressing in each subject and to aid pupils who are behind in their work. In brief, the adviser must be able and ready to counsel the pupil in answer to any personal, social, or educational question which may arise. He is the person to whom the pupil goes for information or other aid whenever he needs help in matters not immediately connected with classwork. Ideally, all work of this type should be performed by the classroom teacher; but until this becomes possible, the makeshift of home-room advising will likely be the most practical method of performing these important services for pupils.

In many schools the home room is the unit for all announcements, for various drives or campaigns, and for activities intended to generate school spirit. These duties must be performed effectively by the advisers in such schools.

The collection of personal data is often placed in the hands of home-room advisers. The details of this problem are presented in Chapter III as aspects of the teacher's work, but they apply as well to home-room advisers in many schools. The work involves all types of personal information about the pupil and requires the administration of various mental tests, personal-traits forms, and questionnaires for personal data. Following the administration of the tests and forms comes the interpretation of the data, a task which also is often delegated to the adviser. Finally, the adviser is the one who makes use of the information as he counsels his individual advisees.

Class Sponsorship

A class sponsor has certain social and educational duties to perform for the class or group which will graduate together. Often a sponsor has a class from the time it enters secondary school until it graduates. As sponsor for a class the teacher has frequent contact with home-room advisers who have members of his class in their home rooms, and his

advisory duties overlap those of the home-room adviser to some degree. But the main functions of the two offices are different.

The class sponsor aids the class in all its social activities. He acts as adviser when the class is planning a program, a party, or a dance. When a program is presented, he is responsible to the school for its success. However, he will make the pupils feel that they are primarily responsible. He is likewise responsible for the proper conduct of the class when the parties or dances are held.

If the class wishes to engage in any enterprise as a class, the sponsor acts as adviser. For example, a class may wish to present a gift to the school, to provide ushers for a school program, to prepare an annual, or to provide hosts and hostesses in the school cafeteria or lunchroom for a semester. It is the sponsor's duty to aid the class in any social or service activity that has been approved by the school as a class project.

The educational activities of the sponsor are often limited to checking the record of the members of his class to ascertain whether they are qualified for graduation. This is a small task in the average school, but becomes a large responsibility when the class has several hundred members.

In small schools which have only one home room for each class it is probably best for the same teacher to act both as home-room adviser and as class sponsor.

Instructional Supplies

As a general rule the supplies needed for classwork will have been purchased before a teacher arrives in a community to begin his first year in the school. Under unsystematic management, however, the teacher may be required during the first week to submit to the principal or to the superintendent a list of instructional supplies which he considers necessary for his work.

In the typical school of average size, where facilities for business management are not highly developed, the teachers are required at the end of each year to make an inventory of all supplies in their classrooms and to prepare a list of additional materials needed for the following year.

Consequently all teachers should be informed in the problem of instructional supplies and prepared to aid in requisitioning them. Engelhardt defines supplies as

Materials consumed or destroyed when used.

Materials the normal life of which, when in use, is not more than two years.

Fragile articles frequently broken with customary usage and small articles frequently lost under similar circumstances.¹

This classification is intended to enable the financial officer of the school to keep separate accounts for supplies and for the more durable materials which are designated as equipment. Usually teachers are requested to list supplies and equipment separately. The list of supplies, for example, would include such items as outline desk maps, chemicals, colored crayon, paste, paper, and similar items, while the equipment list would include maps, globes, balances, display frames for posting class-work, books, and other materials which last several years.

A highly competent school executive usually anticipates all needs of the teachers under his administration and meets those needs to the limit of the budget, but even such a superintendent or principal frequently calls upon teachers for advice concerning textbooks, library books, and other equipment or supplies.

Several opportunities to learn of equipment and supplies are available to prospective teachers while still in college. In the first place they may list all the supplies and equipment used in their college courses in fields in which they expect to teach. They may also inspect all materials used in the secondary school in which they work as student teachers and learn of the relative values of the materials. Most students likewise have access to at least one other secondary school. Many colleges are located in centers in which teachers' conventions are held. In the convention halls may be found exhibits of practically every kind of material used in schools. The exhibits are open to prospective teachers as well as to teachers already in service. Finally, the student may find listed in any educational journal in his college library a number of firms which manufacture school supplies. If the catalogues of the firms are not already in the school library, the student may obtain one from a company which prepares supplies for the field of his major interest. Time given to this problem before one begins his work as teacher is well spent.

Attendance and Class Records

Every teacher is required to keep accurate attendance and scholarship records of each pupil in his classes. The routines by which these duties are performed vary in different schools. In many larger schools all follow-

¹ Fred Engelhardt, *Public-School Organization and Administration*, p. 481. Ginn and Company, 1931.

up of absences is handled by the principal's office or the attendance officer, but in smaller schools the absentee work is frequently assigned to a teacher. In such a school all the teachers report absences at the beginning of the day, and the one in charge of the work either makes contact with the home immediately or makes a record of each absentee and later obtains "an excuse" from the parent. Where an attendance law applies to secondary-school pupils, the teacher in charge of attendance should understand the provisions of the law and report cases of violation to the principal without delay.

Class records of scholarship, however derived, are reported to the principal's office either monthly or every six weeks. In small schools the teacher also places his pupils' marks upon the report cards periodically. He is also required in the smaller schools to enter his marks for each semester upon the permanent records in the school office. Each school has its official forms and its own system of records, with which the teacher will be required to conform.

So-called Extra-curricular Activities

It has been made clear in various places in this volume, particularly in Chapter III, that, so far as time will permit, all experiences considered of value to the adolescent should be included in the offering of the school. It is unsound to label a portion of those activities as curricular and the remainder extra-curricular. The prefix "extra" is particularly odious because it implies that the experiences included under the term have no social recognition but instead constitute a sort of illegitimate offspring of the schools.

It is true that some of the experiences formerly called extra-curricular have been absorbed by the regular offering. This applies, for example, to physical education, music, and art, although in some schools these activities, like stepchildren, frequently are poorly cared for. Until all the wholesome experiences now included under extra, or allied, or co-curricular activities have been absorbed by the fields to which they are related or have become established as new fields, teachers will be expected to help to direct them outside the regular classroom program of work. Consequently the prospective teacher should prepare himself for the work.

The college student is advised to pursue at least two extra-curricular activities in college. Such participation will be an effective preparation for directing similar activities in the secondary school. It would obviously

be best for the student to select those campus activities which are still carried out in the typical secondary school, provided he finds a genuine interest in them.

The activities included in the secondary school as extra-curricular cover a very wide range of wholesome experiences. Reavis¹ found almost three hundred different clubs and activities in the two hundred and twenty-four selected schools which he surveyed. Since it is obviously impossible for any prospective teacher to prepare for all extra-curricular activities which he might be called upon to direct, he should select one or two lines of extra-curricular work and be prepared to assist in them. The seven groups of activities as classified by Reavis² include (1) student government, school service, and honorary organizations; (2) social, moral, leadership, and guidance clubs; (3) departmental clubs; (4) publications and journalistic organizations; (5) dramatic clubs, literary societies, and forensic activities; (6) musical organizations; and (7) special-interest clubs.

In the schools studied by Reavis the organizations most frequently found under group one were the Student Council, the Library Squad, the Safety Patrol, and the Service Club. The fact that twenty-nine different organizations were listed in the first group bears evidence of the wide variety of experience included under the classification. This fact also indicates the wide range of service expected of the teachers in charge of the work.

The wide ranges of extra-curricular experiences of pupils and of services performed by teachers were similarly revealed in each of the other seven types of activities. Group two included twenty-three different activities, most frequently Girl Reserves, Hi-Y, Leaders' Club, and Girls' Social. The departmental clubs of group three consisted of sixty-nine organizations, of which French, German, Latin, Art, Home Economics, and Typing clubs were the most frequent. Of the ten publications clubs the Journalism Club, the annual school publication, and the weekly paper were found more often than the others. The dramatic and related activities included twenty-seven organizations, the most recurrent of which were the Dramatic Club, the Debate Club, Scribblers, and Masquers. Twenty-two music organizations were found in the two hundred and twenty-four

¹ William C. Reavis and George E. Van Dyke, *Nonathletic Extra-curriculum Activities*, National Survey of Secondary Education, Office of Education Bulletin, 1932, No. 17, Monograph No. 26, Chapter III. United States Government Printing Office, 1933.

² Ibid. pp. 78-79.

schools, of which the Girls' Glee Club, the Boys' Glee Club, and the Music Club were found more often than the others. More than a hundred special-interest clubs were operating in the group of schools surveyed. Those found in as many as five different schools were the Stamp, Archery, Game, Model Airplane, Radio, and Travel clubs.

The relation of the clubs to the regular offering of the school was clearly described as follows :

Four relations between the extracurriculum activities and the regular school program of studies were found. First, clubs are organized as required phases of the work in a class or subject in the regular curriculum. Participation in these activities is required of all pupils regularly enrolled in the class or subject. For example, work on school publications is sometimes organized as a required part of the work in the course in journalism, or in some particular English class.

Second, activities and clubs are informally and indirectly related to the work of classes or subjects in the regular curriculum. Frequently departmental clubs are regarded in this manner. Although the work of these clubs may be closely related to the work of classes or subjects of the regular curriculum, participation in the clubs is not compulsory for pupils who are enrolled in the related classes or subjects.

A third relation between the extracurriculum clubs and the regular curriculum is that of clubs being conducted entirely independently of the regular curriculum. This is virtually an absence of relationship. The avocational clubs in Group VII practically always are so organized, as are many of the other types of activities.

The fourth relation is that of clubs and activities conducted as regular classes in the school program. These activities meet regularly as do other classes, and pupils receive credit for participation in the activities just as they receive credit for participation in physical education, art, and other special classes. Strictly speaking, these activities are not extracurriculum organizations. They are a part of the regular school program of studies. A large portion of the musical activities have in this manner found their way into the regular school curriculum. Some of the publication organizations also have been included in the school program in the form of classes in journalism. In this study none of the clubs outside these two groups bore this relationship to the curriculum.

It was found that nearly two-thirds of all the clubs were organized under the third relationship, that is, the activities were organized and conducted in complete independence of the regular curriculum. In these cases participation is usually voluntary on the part of the members and is open to all pupils regardless of the subjects or classes in which the pupils are enrolled. The activities and programs conducted by the clubs are only incidentally connected with the regular curriculum. More than a fourth of the clubs were definitely related to the

work of the regular school program, three-fourths of all the departmental clubs having this relationship. Slightly more than 1 per cent of the clubs were conducted as required phases of a specific class or subject within the regular school program.¹

The quotation from Reavis indicates a decided tendency in about a third of the clubs to merge the extra-curricular work with the regular courses. Two thirds of the organizations are still little inclined to unite their work with classroom activities. It is in this wider area that the prospective teacher may expect to be called upon for service outside his field of teaching. The activities included under the other third are no longer strictly extra-curricular; they have become curricular in varying degrees, and as such will legitimately occupy much of the teacher's attention. The teacher should be prepared for both the semi-curricular and the entirely extra-curricular until both become purely curricular in the sense of being established as desirable experiences and given a definite place in the program with the older fields.

Committee Membership

A democratic administration of schools permits the teacher to participate in formulating the policies and in developing the practices of the school. Participation is made possible largely through committees. The teacher therefore should consider such committee membership an opportunity rather than a task. In addition to the opportunity type of committee work, however, there is much committee activity that is nothing more than work to be done. Both types of committee activity are expected of teachers and are implied in the teacher's contract with the board of education. The teacher is subject to the call of the principal or superintendent for such work.

Various committees in the more progressive school systems give the teacher a voice in the management of the school. In the curriculum committee, for example, the teacher helps to determine the offering of the school, the order in which subjects shall be given, the amount of time to be devoted to each, and other important curricular problems. The textbook committee carefully considers the numerous available textbooks and recommends those best suited to the school. The committee on faculty meetings in some schools has much of the responsibility for the in-service growth of the staff. Schedule-making in some schools is in

¹ William C. Reavis and George E. Van Dyke, op. cit. pp. 86-87.

charge of a committee of experienced teachers, usually with the principal as chairman. Other committees deal with community relations, social affairs, extra-curricular activities, the use of the radio, classroom experimentation, and other important aspects of secondary-school teaching and management. The poorly trained principal or superintendent frequently attempts to solve all problems of management without the advice of his staff. In fact, some jealously guard all administrative and policy matters as prerogatives of the administrative officer. Administrators of wider views and of more thorough training for their work and therefore less fearful of revealing their own weaknesses have developed a democratic system of management by enlisting the co-operation of their staff.

Certain work of the school, not related to formulating policies or to developing practices, is sometimes performed by committees. Occasionally the "committee" consists of one teacher. For example, the attendance committee follows up cases of tardiness and absences and presents suggestions to the faculty for their control. The records committee has an important function to perform in those schools in which the work is not done by the principal or his secretary. Other work frequently delegated to committees includes hall duty, lunchroom supervision, and assemblies. Recently, however, there has been a decided tendency to give pupils the responsibility in such work of the school.

Staff Relations

The staff of a secondary school is engaged in an important social enterprise. A spirit of cordial co-operation must prevail if that enterprise is to attain the highest degree of success. Obviously the rules of courtesy and etiquette that obtain with all other groups of cultured people should be observed by all members of the staff. These proprieties when practiced by the teachers not only make for harmony within the staff but also set standards for the pupils.

Hatreds and jealousies do exist in many secondary-school staffs. There would be no point here in concealing that fact. Furthermore, many persons with vindictive natures and selfish viewpoints have achieved high administrative offices in the public schools, but they are rarely respected by their associates or esteemed by their students. In all truth, there is no place for petty spite, jealousy, or hatred in the secondary-school staff. The person who has his eye upon the major purposes of secondary education will have no time for such indulgences; he will be too busy with his work.

The young teacher should do his utmost to fit into the organization as he finds it. There are reasons for the system that he will find in operation; and, although some of the reasons may not be sound, his obligation at first is to fit into the plan. He will have had the opportunity to learn of the school before signing his contract. Later, if he has objections to certain practices of the school, he has the right to state his objections to the principal or the superintendent. He has, however, no right to criticize the school to anyone except his officials. The proper body to which to appeal if his officials ignore his objections is the board of education. Such an appeal is almost never made, because the differences may usually be settled by the teacher and the official. In a large proportion of such cases the young teacher finds that he has been mistaken in his judgment of the practice.

Many secondary schools have supervisors of instruction. The supervisor, if well qualified, is of great assistance to the beginning teacher.¹ Although he will frequently be forced to offer constructive criticism, his function is not to criticize teachers but to improve the instruction in the school. The most cordial relations must prevail between supervisor and teacher before the instruction can be greatly improved.

It is entirely possible that the young teacher may find cliques in the staff, divided upon some petty political or other local quarrel. Small towns are notorious for the pettiness of their community quarrels, and any teacher who has had experience in larger communities realizes that petty quarrels are not limited to small towns. It is entirely unnecessary and wholly unwise for the new teacher to become allied with either side. He will be respected by both groups if he maintains a neutral attitude toward matters that do not concern him and pursues his own work with all his energy.

In all his committee work the teacher should carry his full share of the load. As in all fields of activity, a shirker soon loses the respect of his associates. In schools in which the committee work becomes too burdensome the teacher has a right to warn his principal or superintendent that the committee work is reducing his classroom effectiveness. In such cases a conference usually will result in a shift of schedule or a release from some of the committee work.

It is considered a weakness for a teacher to express an unfavorable opinion of his predecessor. There may be just reason for such an opinion,

¹ See Roscoe Pulliam, *Extra-instructional Activities of the Teacher*, Chapter XIV. Doubleday, Doran and Company, Inc., 1930.

but no good can result from expressing the opinion. The teacher will be wiser to provide no reason for his successor to hold an unfavorable opinion of him.

It is equally unwise to criticize an associate except when the associate's action jeopardizes the welfare of the school or encroaches upon one's own rights. Then the matter should be discussed first with the offender. If a satisfactory agreement is not reached, one has the right to confer with the principal. It then becomes the principal's problem. If the matter concerns the teacher personally and if it is not settled by the principal, one should inform the principal that unless the problem is solved an appeal will be made to higher officials. Under no condition, however, should the teacher criticize either an associate or the school to a layman or in the presence of any other person not concerned in the difficulty. The teacher will rarely have reason to consult an associate in a case of this kind, but when such an occasion does arise he should have the courage to act in the proper manner.

Many of the relations of staff members are covered by the code of ethics presented in Chapter I. The teacher who follows the code precisely will rarely if ever regret his action. Furthermore, he will add strength to the profession, thereby enabling it to perform successfully the function which society has delegated to it.

School Spirit

A teacher is expected to contribute to the morale of the school both by attitude and by activity. In maintaining an attitude of co-operativeness toward associates and pupils, in displaying enthusiasm for the worthwhile efforts of others, and in showing genuine appreciation of the worthy achievement of others, a teacher will help to build a high esprit de corps wherever he may be. The school spirit to which reference is made here goes to the roots of the educational process. It is the glow which accompanies the happy association of minds at work on important problems. It is not the superficial type of school spirit which bubbles over at athletic events, although that kind of spirit is not to be disparaged, because it perhaps has real value when not indulged to excess.

An important element in the healthy attitude which a teacher should have toward the school and its purposes and toward his co-workers, both fellow teachers and pupils, is that of judicial criticism. There is a vast difference between sentimental agreeableness and genuine appreciative-

ness. The latter contains the element of appraisal. Fellow teachers and pupils are unlikely to cherish encouragement from one who is indiscriminate in his praise, but both will seek commendation from the teacher whose standards of values are high and who is critical in his application of those standards. Such a teacher invariably raises the intellectual level of a group with which he is associated and in adding tone to the school contributes to its spirit.

Social Affairs

The teacher has social obligations to pupils, staff, and community. In his everyday contacts in the school and elsewhere he should be able to meet people well and to converse with them in an interesting manner. No teacher can be a recluse and meet his obligations in full. In addition to his casual contacts the typical social affairs of the school and of the community require his consideration. These affairs range in different types of communities from such parties as those pictured by Sinclair Lewis in *Main Street* to formal receptions. Parties, hikes, picnics, and receptions of various types have a place in almost every school. They break down the artificial traditional teacher-pupil barriers and foster the cordial relationships which should exist between the two. The purely social functions of the staff in like manner build the morale of the school and provide wholesome recreation for the teacher. Many of the better homes entertain the teachers socially. Such appearances in local society may test the social qualities of those who have not anticipated and prepared for them while still in college. Earning one's way through college may be an admirable undertaking, but it is a very costly practice if performed at the sacrifice of the wholesome, inexpensive social experiences of college life.

The foregoing discussion does not imply that the teacher, if a man, should be a Beau Brummel or, if a woman, a society queen. It is easily possible to engage in too many social activities while teaching and as a result to be misjudged by a community even when innocent of breaches of conventions. But it is also easily possible to be too self-centered and too unsocial while in a teaching position. It is obvious that the teacher should avoid both extremes by giving to social affairs the amount of attention which is customary in the community where he teaches.

Special Occasions

Every teacher is expected to assist with the special events of the schools. Some secondary schools have adopted the college custom of home-coming. To make the occasion a success, teachers and pupils have many duties to perform on alumni contact committees, program committees, finance committees, decorations committees, grounds committees, concessions committees, ticket committees, reception committees, and committees for other aspects of home-coming.

Some states celebrate the national and state holidays as special days without dismissing school. Each occasion demands careful planning and practice of suitable programs by home rooms, classes, or the entire school. The teacher is responsible for the successful performance of the pupils on all programs held either during school hours or in the evenings.

Many schools have exhibits of schoolwork each semester or each year. As in the holiday or home-coming events, the teacher is responsible for the success of the exhibit. Various committees begin work early in the year. Each class plans work to be exhibited and, when stimulated, eagerly prepares and preserves the materials for the exhibit. As the day approaches, the exhibits must be mounted; and plans must be made for welcoming and entertaining the visiting patrons. The whole school becomes a beehive of activity on the day of the exhibit. Each teacher holds classes for the parents to visit during the day, and everyone enters the festivities during the evening. Many school officials still find the semi-annual or annual exhibit of schoolwork one of the most effective means of maintaining the interest of school patrons in the work of the school.

The field day is another event, common to numerous schools, which requires much work of the teachers. The athletic department rarely has a large enough staff to handle the affair unaided. In the field day at consolidated schools, frequently all the smaller schools which send their graduates to the consolidated unit are invited to participate. In addition to athletic events such contests as spelling matches, one-act plays, music events, four-minute speeches, and other competitions of scholastic or artistic work are held. When the events are well managed, much value in giving desirable publicity and in developing school morale is derived from such yearly gatherings. When the field day is poorly managed, however, the competitive spirit runs wild and defeats the purpose of the occasion. Careful management demands much co-operative effort by the teachers, pupils, and patrons.

Still another event of special importance in many secondary schools is the visit of pupils from the elementary schools. The purpose of the occasion is to permit the incoming pupils to see the secondary school in operation. In well-organized schools the pupils will have learned much of the secondary school before the visit and perhaps will have planned their courses for the first year. The informal visit enables the staff of the secondary school to welcome future pupils, to answer numerous questions, and in other ways to break down the fears and false impressions which the elementary-school pupils may have formed of the secondary school.

Before the end of his first year of teaching, the teacher will learn of the numerous tasks related to commencement exercises which are delegated to the teachers. The sponsor of the class, and the principal in smaller schools, usually carry most of the responsibility, but often several teachers have specified duties to perform. Many schools still hold a series of events during commencement week, including a religious service, a class night, a class play, and the graduation exercises. The responsibilities are usually divided among all teachers who are qualified to assist in the various occasions.

Buildings and Grounds

Under ideal conditions the classroom teacher should have no responsibility pertaining to the school building and the school grounds except that of causing pupils to protect all school property. Few teachers have the privilege of working under ideal conditions, however. It is therefore often necessary for teachers, in addition to promoting a proper pupil attitude toward school property, to have an active part in the protection and the appearance of the equipment, building, and grounds. At all times the teacher is responsible for the equipment in his room and for the appearance of the room. When necessary he should be ready to check abuses of property which come under his observation. The need for sanitation should be discussed as a basis for overcoming careless habits and thoughtless acts of pupils which result in unclean floors and walls of the building and in unattractive grounds. A positive approach to the problem is made in small schools by enlisting the co-operation of the pupils and having volunteer squads to assist in mounting appropriate decorations for the rooms and corridors and in landscaping the grounds. The least that is expected of a teacher in these problems is that he set the proper example for the pupils to follow.

Parent-Teacher Relations

The number of contacts that teachers are expected to have with parents is determined by the size and policy of the school. Contacts are more easily made in small communities, as a rule, but the policy in many large schools offsets the difficulties of distance and larger number of parents by providing specific practices to facilitate the making of contacts. In some schools special days are set aside for parents to visit the schools; teachers are urged to visit homes, although they are rarely excused from regular duties to do so; school officials encourage parents to entertain teachers in their homes; and parents are invited to observe regular classes frequently.

The National Congress of Parents and Teachers has parent-teacher associations in a large percentage of the schools of the nation. The chief aim of the national and of the local organization is the same, that of co-operative effort of parent and teacher for the child's welfare. Teachers are expected to participate on programs of the association, to become acquainted with the parent and perhaps to discuss the child's welfare during the social hour which the association provides, and to engage in studies or other enterprises of the group.

The problem of knowing the home background of the pupil is presented in Chapter III, and its relation to classroom work is discussed. Since a full knowledge of the pupil's background is frequently the critical factor in the success the teacher has in directing a pupil's work, it is highly important that every teacher exert the effort necessary to learn of the child's home life.

Community Contact

The teacher should consider himself a citizen of the community in which he teaches. Although his primary obligation is that of serving well as a teacher, as a citizen he has certain obligations to the community. His other community services include work in the religious and service organizations of the community. He is usually free to attend the church of his preference and is almost invariably expected to assist with the work of the church he selects. In the small communities the men teachers are frequently requested to serve upon committees of the service clubs or the businessmen's organizations. Many of them aid the American Legion in its peacetime programs of junior baseball, Americanization of the foreign-born, and child welfare. The women have similar duties to perform for the corresponding organizations of women in all communities of any size.

Every teacher has important obligations to the profession of education in all community contacts. His classroom work and his relations with parents should be such that they will give the parent a correct understanding of education in modern society. Whenever a false notion of education is expressed in his presence, he should act as an interpreter of the schools. Furthermore, a legitimate amount of school publicity should come from the teacher. Such work may be performed by assisting in occasional essay contests for pupils, in providing material for the local newspapers, or in speaking before community groups on the purposes and practices of modern education.

In all community contacts the teacher must observe and respect the customs of the community. This is especially important when the teacher finds himself in a community quite different from the one in which he has previously lived. Some of the customs will in such cases seem queer to him, but he should remember that his habits will seem just as queer to those whom he meets and that he is very much in the minority. The customs of the community are rooted in the religious, racial, and national traditions of the people whose children he teaches, and his success in teaching in the given community depends in no small degree upon his reactions to any customs which may seem odd to him.

To react courteously to strange customs does not require that one adopt them as his own. No teacher is bound to renounce his own beliefs or his own proper ways of living and to subscribe to those considered proper by others. But courtesy as well as policy requires him to respect the right of others to adhere to their beliefs and to follow practices derived from them. In all community and school contacts a very high type of courtesy, implied in the foregoing, should be habitual with the teacher if he is to attain a maximum of success in his teaching.

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CHAPTER XVII · Self-analysis and Professional Improvement

GENERAL VIEW OF THE CHAPTER

Purpose of the Chapter
Self-appraisal and Self-planning of Standards
Use of Standards Set by Others
Professional Reading
Nonprofessional Reading
Membership in Professional Organisations
Research as a Method of Growth
Educational Addresses
Professional Writing
Travel
Postgraduate Study
Promotions
Values Derived from Professional Growth
Selected References for Further Study

Purpose of the Chapter

THE teacher's primary aim is to facilitate the pupil's growth. Various phases of that general aim and numerous techniques for its achievement are discussed in preceding chapters. Closely associated with pupil development is the development of the teacher. The teacher who continues to grow in professional understanding and in his vision of education and of life will, if he remains a classroom teacher, be a better leader of youth than the teacher whose mind does not eagerly and continually seek new ideas. Many teachers of wide vision and profound learning choose to remain in the classroom, philosophically declining promotions or other contemporary marks of what their associates call success. Others broaden the scope of their influence by moving to positions of greater responsibility. Whether he remains in the classroom or becomes a supervisory or administrative official, the teacher who continually improves himself professionally and personally exerts a greater positive influence upon the pupils under his care than the teacher who fails to grow. In exerting a large measure of wholesome influence over his pupils the teacher brings

even greater values to himself. He realizes those values attendant upon a well-developed life.

The several avenues of personal and professional development open to teachers are therefore of significance at this point. The determination to grow varies with individuals and is present in high degree in persons just entering the profession. Inasmuch as the urge to grow is sometimes frustrated because the person does not clearly understand the possibilities for professional growth, this final chapter attempts to clear the way by presenting some of the methods by which the much desired end may be achieved. As the teacher grows, he will find other methods for himself.

Self-appraisal and Self-planning of Standards

The idea of development or growth implies that one has a standard toward which he may work. It also implies that one should determine his present status with respect to that standard. Consequently a very practical method of beginning one's professional improvement is to define clearly the standards to be attained and to determine one's initial status with respect to each standard. The two steps of setting the standards and of measuring oneself by them often involve much study before satisfactory growth can be achieved.

For example, in one school system the problem of self-improvement was rather vigorously discussed in a series of meetings. When the ideas had begun to crystallize, a committee volunteered to draft a self-rating chart that would apply to the teachers of that school system. Each of thirty points was first defined in great detail and later mimeographed in generalized form by the committee as a guide for the teachers. The committee's report was as follows :

SELF-RATING CHART FOR TEACHERS

I. Teacher

1. Attitude : Sympathetic, sincere, fair, honest, patient, tactful, interested, energetic, enthusiastic, cheerful. Rating A.B.C.D.
2. Manner : Cultured, composed, poised. A.B.C.D.
3. Activity : Master of situation, inspiring, encouraging, and directing pupil participation. A.B.C.D.
4. Voice : Pleasant, sincere, kind, courteous. A.B.C.D.
5. Appearance : Neat, attractive, healthy, clean, suitably dressed. A.B.C.D.
6. Preparation : Master of subject, good English, evidence of good planning, self-selected materials, text properly used, materials at hand, aims carried out. A.B.C.D.

7. Initiative: Successful, masters every situation. A.B.C.D.
8. Community activities: Good attitude toward community, 4-H Club leader, P.T.A., church worker, in harmony with spiritual needs of community, respects community's opinion in matters of personal pleasure, co-operates with good movements. lives in community. visits the homes, has love and respect of children and parents, obtains sufficient rest for work, is above entering into community-gossip or joining cliques, does not talk shop away from school. A.B.C.D.

9. Moral influence upon pupils and community. A.B.C.D.

II. Method, Device, or Technique

10. Recitations: Related to child's needs, socialized, practical, interesting, well organized, active, well motivated, aim well carried out. A.B.C.D.
11. Questioning: Proper number, properly presented, clear, concise, stimulating, developmental, inflection good. A.B.C.D.
12. Supervised study: Individual differences cared for, children interested, study active and progressive, reference work well chosen, wholesome atmosphere. A.B.C.D.
13. Discipline: Through interest, honors, self-respect, ambition, pride, emulation, rivalry, humor, rewards. A.B.C.D.
14. Checks: Classroom tests, standardized tests, oral quizzes, games. A.B.C.D.
15. Routine: Passing, roll call, seating, distributing supplies, daily program, changing from one class to another, orderly, prompt. A.B.C.D.
16. Assignment: Definite, clear, specific — related to life activities, individual differences cared for. A.B.C.D.

III. The Pupil

17. Attitude: Teachable, interested, co-operative, happy, wholesome. A.B.C.D.
18. Preparation: Careful, thorough, accurate. A.B.C.D.
19. Health and cleanliness: Eye, ear, speech free from defects, hands and face clean, hair neat, clothing clean, none tubercular. A.B.C.D.
20. Participation: Responsive. A.B.C.D.

IV. The Room

21. General appearance: Clean floor, teacher's desk in order, inside as well as on top, borders attractive, decorations, bulletin board attractive, wall free from markings. A.B.C.D.
22. Color scheme: Walls, shades — pleasing and attractive. A.B.C.D.
23. Pupil's desks: Clean, in order, free from stains and scratches, suited to pupil's size, well placed. A.B.C.D.
24. Blackboard: Proper distance from floor, sufficient for needs of class, clean and attractive. A.B.C.D.
25. Equipment: Books, busy work materials, pictures, bulletin board, thermometer properly used and orderly kept. A.B.C.D.

- 26. Lighting: From the left, or from left and back, shades properly lowered, electric lights. A.B.C.D.
- 27. Ventilation: Air pure and fresh. Proper humidity. A.B.C.D.
- 28. Heating: 68 degrees, uniform throughout room. A.B.C.D.
- 29. Fire protection: Alarms, drills, door opening outward. A.B.C.D.
- 30. Yard: Clean, well kept, shrubbery, trees, walks, fences. A.B.C.D.

SUMMARY: Number of A's --- B's --- C's --- D's ---

Our outline for observing your teaching includes only the above standards. No person can expect to be perfect in all items, but these standards are set for your consideration. We suggest that you study yourself. If you find yourself lacking on some items we recommend that you consult your principal or do some special reading with the aim of improvement.

Committee on Self-Improvement
Town District Public Schools
Beckley, West Virginia.

The teachers who used the chart scored themselves and each other. Advice was interchanged in group meetings, and special demonstrations were arranged at the request of the teachers who found themselves below standard on certain points. Some read and studied privately to remedy their weaknesses. While a few of the items quite obviously would not be suited to all schools, most of them do apply to all teachers; and all items applied to the teachers who used this chart. It served them in a highly satisfactory manner.

Little respect is due some schemes for "developing personality" or for "self-improvement" which promise to work miracles within a short period of time. On the other hand, a careful appraisal of one's assets and liabilities in teaching and a long-time program of improvement have very definite values. Conscious and consistent effort toward clearly defined standards is certain to result in growth.

Use of Standards Set by Others

The standards set by school officials for teachers under their supervision or for candidates seeking teaching positions are usually in the form of rating scales. The scales are prepared primarily for the use of school officials in rating teachers. In some schools, however, they are used also as the basis for teacher self-improvement. The scales thus far devised have not proved highly reliable rating instruments when used by different raters. One may reasonably suspect that the more valuable use of the scales is their use by teachers in identifying the standards and in subse-

quently striving to attain those standards. In any event it is from the latter viewpoint that several scales are here presented. The items carried in the illustrations will identify for the reader the standards which teachers are expected to attain. They should be of value to students who may wish to rate themselves or to have their friends rate them.

Boyce,¹ in one of the earlier studies of rating scales, found one hundred and fifty items on the fifty scales submitted to him by superintendents of schools. From these scales and from his own experience Boyce prepared a list of forty-five traits and arranged them on a form upon which the teacher could be checked for each trait as "Very Poor," "Poor," "Medium," "Good," or "Excellent." Elsewhere (p. 45) he defined the traits as follows:

- I. Personal Equipment includes physical, mental, and moral qualities.
 1. General appearance — physique, carriage, dress, and personal neatness.
 2. * Voice — pitch, quality, clearness of schoolroom voice.
 3. Intellectual capacity — native mental ability.
 4. Initiative and self-reliance — independence in originating and carrying out ideas.
 5. Accuracy — in statements, records, reports, and school work.
 6. Integrity and sincerity — soundness of moral principles and genuineness of character.
 7. Tact — adroitness, address, quick appreciation of the proper thing to do or say.
 8. Sense of justice — fairmindedness, ability to give all a "square deal."
- II. Social and Professional Equipment includes qualities making the teacher better able to deal with social situations and particularly the school situation.
 9. Academic preparation — school work other than professional. Adequacy for present work.
 10. Professional preparation — specific training for teaching. Adequacy for present work.
 11. Grasp of subject-matter — command of the information to be taught or the skill to be developed.

¹ Arthur Clifton Boyce, "Methods for Measuring Teachers' Efficiency," *The Fourteenth Yearbook of the National Society for the Study of Education*, Part II. The University of Chicago Press, 1915. Quoted by permission of the Society.

* The following items were carried in the rating scale but were not definitely defined by the author: Item 2, Health; Item 6, Adaptability and resourcefulness; Item 8, Industry; Item 9, Enthusiasm and optimism; Item 11, Self-control; Item 12, Promptness; Item 19, Interest in the life of the school; Item 20, Interest in the life of the community; Item 21, Ability to meet and interest patrons; Item 25, Daily preparation; Item 27, Care of light, heat, and ventilation; Item 28, Neatness of room; Item 38, Skill and care in assignment.

18. Understanding of children — insight into child nature; sympathetic, scientific, and practical.
 22. Interest in lives of pupils — desire to know and help pupils personally, outside of school subjects.
 23. Cooperation and loyalty — attitude toward colleagues and superior officers.
 24. Professional interest and growth — effort to keep up to date and improve.
 26. Use of English — vocabulary grammar, ease of expression.
- III. School Management includes mechanical and routine factors.
29. Care of routine — saving time and energy by reducing frequently recurring details to mechanical organization.
 30. Discipline (governing skill) — character of order maintained and skill shown in maintaining it.
- IV. Technique of Teaching includes skill in actual teaching and in the conduct of the recitation.
31. Definiteness and clearness of aim — of each lesson and of the work as a whole.
 32. Skill in habit formation — skill in establishing specific, automatic responses quickly and permanently; drill.
 33. Skill in stimulating thought — giving opportunity for and direction in reflective thinking.
 34. Skill in teaching how to study — establishing economical and efficient habits of study.
 35. Skill in questioning — character and distribution of questions, replies elicited.
 36. Choice of subject-matter — skill with which the teacher selects the material of instruction to suit the interests, abilities, and needs of the class.
 37. Organization of subject-matter — the lesson plan and the system in which the subject-matter is presented.
 39. Skill in motivating work — arousing interest and giving pupils proper incentives for work.
 40. Attention to individual needs — teacher's care for individual differences, peculiarities, and difficulties.
- V. Results include evidence of the success of the above conditions and skill.
41. Attention and response of the class — extent to which all of the class are interested in the essential part of the lesson and respond to the demands made on them.
 42. Growth of pupils in subject-matter — shown by pupils' ability to do work of advanced class and to meet more successfully whatever tests are made of their school work.
 43. General development of pupils — increase in pupils' ability and power along lines other than those of subject-matter.

44. Stimulation of community — effect on life of the community tending to improve or stimulate its various activities.
45. Moral influence — extent to which the teacher raises the moral tone of the pupils or of the school.

A more recent type of scale is somewhat more reliable than Boyce's as a rating device and at least equally valuable to the teacher in defining standards. The newer form carries the definition of the standards in addition to their names. Tiegs¹ and his associates reduced the one hundred items found on fifteen rating scales to forty-one. The traits were defined on the scale and arranged by Tiegs in the following manner :

<i>I. Personal Characteristics</i>			
1. PERSONAL APPEAR- ANCE	A B Usually attrac- tive; neat; whole- some	C Ordinary; not con- spicuous	D E Unkempt; slovenly
2. SPEECH	Voice unusually pleasant; excellent enunciation; fluent	Ordinary; suffi- cient; upholds own end of conversation	Voice thin, high, harsh; enunciation indistinct; speech defect
3. HEALTH	Unusually vigor- ous; never absent for illness	Fair health; absent occasionally	Frail; absent 15 or more days per year
4. PERSONALITY . . .	Impressive; attrac- tive	Ordinary; would not attract special attention	Repellent; gener- ally disliked
5. DISPOSITION . .	Unusually optimis- tic; animated; cheerful	Ordinary; gener- ally in good humor	Dejected; melan- cholic
6. FORCE	Very marked; makes things move; has convictions	Average; suffi- cient for ordinary needs	Helpless; follows rather than leads; no opinions to defend
7. CHARACTER	Irreproachable; highest ideals and conduct	Conforms; no spe- cial strength or weakness	Weak; unstable
8. MENTALITY	Brilliant; unusual	Average; sufficient for ordinary needs	Stupid; dull
9. TACT	Meets difficult situ- ations frankly, ade- quately, and with- out offense	Meets ordinary situ- ations satis- factorily	Cannot get along; many antagonisms

¹ Ernest Walter Tiegs, *An Evaluation of Some Techniques of Teacher Selection*, pp. 58-61: Public School Publishing Company, 1928.

The other division of Tiegs's scale included teaching ability, professional ideals and attitudes, routine, and conditioning factors. Under teaching ability he listed leadership, conduct and discipline, teaching type, individual differences, aims, motivation, skill, balance, response, teaching to study, and results. Professional ideals and attitudes included co-operation, attitude toward supervision, relation to co-workers, relation to community, loyalty to United States, professional growth, professional knowledge, professional interest in schoolwork, attitude toward research work, and contribution to education. The items under routine were pupil hygiene, class routine, economy, and reports. The conditioning factors referred to the conditions under which the teacher worked rather than to traits of the teacher. They included ability level of class, behavior level of class, achievement level of class, supplies and equipment, neighborhood and home environment, attitude of other teachers, and assistance by principal.

The writer and an associate¹ reviewed forty-five studies and reports of rating scales made before 1931 and from the traits most frequently desired by school officials prepared the scale on the opposite page.

The three scales presented provide a basis for self-analysis and appraisal for prospective teachers as well as for teachers in service. Persons still in college have the advantage of library facilities and staff counsel in their attempts to attain those standards set by the scales which can be attained before one begins to teach.

In one study ten thousand secondary-school seniors presented their reasons for liking one teacher best and another least. Their reactions afford the prospective teacher a particularly interesting basis for rating himself. The ten reasons most frequently given by the seniors in a list of forty-three different reasons for liking teachers best are ranked in Table 17.

The reason most often given for liking teachers best pertained to methods of instruction, "Is helpful with school work, explains lessons and assignments clearly and thoroughly, and uses examples in teaching." The reason which ranked fifth dealt with motivation. It will be noted from Table 17 that the eight other reasons referred to personal qualities.

A negative view of teaching is afforded by Table 18 from the reasons the seniors gave for liking certain other teachers least. A conglomeration of undesirable personal qualities and inferior methods of teaching appears in the reactions of the pupils. More than seventeen hundred seniors

¹ Miss Marjorie Palmer, Bureau of Recommendations, The University of Minnesota.

Form D.

UNIVERSITY OF MINNESOTA
BUREAU OF RECOMMENDATIONS
MINNEAPOLIS, MINNESOTA

Will you kindly describe the teacher for each trait as defined, by checking at the proper point along the line for the given trait. (Caution: A teacher's ability or disability in one trait should not color one's judgment of him in another.)

In describing this teacher please compare him or her with teachers of about the same number of years of experience.

----- Check along the line to describe the teacher for
Name of teacher _____ the quality as defined.

Qualities	Lowest 10 %		Average										Highest 10 %	
	0	1	2	3	4	5	6	7	8	9	10			
<i>Personal Grooming:</i> Neatness. Appropriate- ness. Good taste														
<i>Teaching Personality:</i> Poise. Judgment. Mental alertness. Vivacity. Sense of humor. Resourcefulness. Tact. Initiative. Dependability														
<i>Loyalty:</i> Willingness and ability to uphold school policies and to co-operate with asso- ciates and supervisory officials														
<i>Vitality:</i> General physical condition. Buoy- ancy. Ability to be on duty every day . .														
<i>Knowledge of Subject Matter:</i> Mastery of high- school subject. Breadth of interest. Back- ground														
<i>Selection and Organization of Subject Matter:</i> Independence of judgment as to proper ma- terial. Clearness and effectiveness of or- ganization														
<i>Method:</i> General mastery of method. Ability to adjust method to various kinds of content and to individual differences in pupils . .														
<i>Class Achievement:</i> Progress of class while in charge of this teacher														
<i>Management, Motivation, and Discipline:</i> Ability to secure good working conditions. Interest and eagerness of class														
<i>Success as a Teacher:</i> Relative standing the teacher has earned in your estimation as compared with other teachers of the same experience														
<i>Other Qualities:</i> (Added if further description of the particular teacher is necessary.) . .														

Brief supplementary or summary statement:

Name _____ Official position _____
Date _____ Address _____

TABLE 17.¹ REASONS FOR LIKING "TEACHER A" BEST, ARRANGED IN ORDER OF FREQUENCY OF MENTION [AS REPORTED BY 3725 HIGH-SCHOOL SENIORS]

<i>Reasons for Liking "Teacher A" Best</i>	<i>Frequency of Mention</i>	<i>Rank</i>
Is helpful with school work, explains lessons and assignments clearly and thoroughly, and uses examples in teaching . .	1950	1
Cheerful, happy, good-natured, jolly, has a sense of humor, and can take a joke	1429	2
Human, friendly, companionable, "one of us"	1024	3
Interested in and understands pupils	937	4
Makes work interesting, creates a desire to work, makes class work a pleasure	805	5
Strict, has control of the class, commands respect	753	6
Impartial, shows no favoritism, has no "pets"	695	7
Not cross, crabby, grouchy, nagging, or sarcastic	613	8
"We learned the subject"	538	9
A pleasing personality	504	10

TABLE 18.² REASONS FOR LIKING "TEACHER Z" LEAST, ARRANGED IN ORDER OF FREQUENCY OF MENTION [AS REPORTED BY 3725 HIGH-SCHOOL SENIORS]

<i>Reasons for Liking "Teacher Z" Least</i>	<i>Frequency of Mention</i>	<i>Rank</i>
Too cross, crabby, grouchy, never smiles, nagging, sarcastic, loses temper, "flies off the handle"	1708	1
Not helpful with school work, does not explain lessons and assignments, not clear, work not planned	1025	2
Partial, has "pets" or favored students, and "picks on certain pupils"	859	3
Superior, aloof, haughty, "snooty," overbearing, does not know you out of class	775	4
Mean, unreasonable, "hard boiled," intolerant, ill-mannered, too strict, makes life miserable	652	5
Unfair in marking and grading, unfair in tests and examinations	614	6
Inconsiderate of pupils' feelings, bawls out pupils in the presence of classmates, pupils are afraid and ill at ease and dread class	551	7
Not interested in pupils and does not understand them . . .	442	8
Unreasonable assignments and home work	350	9
Too loose in discipline, no control of class, does not command respect	313	10

¹ From Frank W. Hart, *Teachers and Teaching, by Ten Thousand High-School Seniors*, Table I, p. 131. 1934. By permission of The Macmillan Company, publishers.

² Ibid. Table II, pp. 250-251.

listed such traits as "Too cross, crabby, grouchy, never smiles, nagging, sarcastic, loses temper, 'flies off the handle.'" The elements of method which appeared among the ten most often mentioned of sixty-three different reasons were "Not helpful with school work, does not explain lessons and assignments, not clear, work not planned, unfair in marking, unfair in tests, unreasonable assignments and home work," and "too loose in discipline."

Professional Reading

It is probably true that every professional worker learns much more about his profession after leaving college than he did while in college preparing for the profession. Physicians eagerly read their medical journals and their monographs on researches in all fields of medicine within the range of their practice. Dentists in similar manner constantly seek new ideas and new applications of older ideas. Lawyers follow unusual cases with great interest and study the interpretations of judicial bodies as social trends demand readjustment of governmental policies. The information acquired in college soon is forgotten unless used in the professional work, and the skills acquired in undergraduate days are lost unless practiced. Both types of learning must be kept alive in subsequent study and practice if the professional worker is to make progress.

In education new books are appearing each year. No teacher will find time to read more than a small proportion of them, but each teacher should read all in his special field. The National Education Association selects and lists the sixty best educational books published each year.¹ From the list the teacher may choose eight or ten closely related to his field. Many teachers have standing orders with book companies for inspection copies of all books in their fields. Those of merit may be purchased either for the school library or for the teacher's personal library.

Various studies of the magazines preferred by educational workers have shown *The School Review*² and *School and Society*³ to be of outstanding value to teachers. *The School Review* carries reports of research studies, discursive articles pertaining to secondary education, and edi-

¹ Published annually in the *Journal of the National Education Association*. National Education Association, Washington, D.C.

² *The School Review*, "a journal of secondary education," is published monthly by the Department of Education of the University of Chicago. (\$2.50 per year.)

³ *School and Society*, a weekly magazine which deals in general with educational problems, is published by The Science Press, Grand Central Terminal, New York. (\$5.00 per year.)

torial comment of exceptional value to secondary-school workers. For secondary-school teachers it may well be listed first.

In addition to the educational magazines of general interest, of which there are more than fifty published,¹ the teacher will find available several magazines which deal specifically with his own field. Thus in the field of art three magazines are published; in business and commercial education, seven; in English and speech, seven; in mathematics, two; in science, seven; in social studies, ten; and in each of the other fields, at least three. In the magazines for each field new techniques of teaching are discussed, new subject-matter content is presented, new viewpoints are explained, unusual experiences are related, and current problems of teaching in the field are treated by recognized leaders. The library of every institution which offers professional courses in education makes available to students a number of the more important educational periodicals. Before leaving college every student should become acquainted with several of the best and select two or three for his subsequent professional reading.

Nonprofessional Reading

The foregoing discussion does not imply that a teacher's reading should be restricted to professional books and journals. On the contrary, nonprofessional reading excels the professional in its significance for the teacher's growth. The professional reading will keep the teacher abreast of his profession, whereas the nonprofessional will keep him abreast of his times and, what is more important, will continually widen his horizons.

Since the opportunity for nonprofessional reading is almost limitless, some care should be exercised in deciding what to read. If the teacher's background in literature is limited, he will profit much from reading the masterpieces. Political history offers an equally rich field. The history of science and mathematics should be appreciated by all teachers. A knowledge of the development of religion and an understanding of the systems of philosophy will do much to enrich the teacher's mind. The history of art and music offers the teacher deeper insights and broader conceptions of life.

It has been stated that the teacher should help the pupil to solve the problems he faces in contemporary life. To do this, as well as to develop

¹ Carter V. Good, A. S. Barr, and Douglas E. Scates, *The Methodology of Educational Research*, pp. 856-863. D. Appleton-Century Company, Inc., 1936.

his own life to the fullest, the teacher must be a student of contemporary life. If his college training included sociology, economics, and political science, he will have a basis for his current reading in those fields. If he lacks such training, he should do the basic reading first. The interpretations of modern life found in current masterpieces of fiction should not escape him. New developments in science, new trends in government, and new theories in sociology will aid him in interpreting modern life to the child. Movements in other nations and the significance of those movements to the world should be studied for the understanding they will give of modern life. Thus the teacher's interests should embrace as many important aspects of life as possible, and to each interest he should devote a share of his nonprofessional reading and study.

Membership in Professional Organizations

Through their professional organizations workers in education have improved their service to society. Membership in the organizations enables the teacher to grow and thereby aids him in meeting his obligations effectively.

Among the teachers' organizations the state education association should be mentioned first. Through its official publication, its state and regional conventions, and its numerous committees the state education association in many states unites the teachers into a well-organized group of workers, interprets the educational program of the state, aids in solving educational problems, and exerts a pronounced leadership in educational affairs. Every teacher should be a member of his state association and participate in its work. This is an obligation as well as a means of professional growth.

The National Education Association attempts to perform for the nation functions similar to those performed for the state by the state association. The organization in 1935 had a membership of about two hundred thousand, of whom fifty-five hundred were life members. Classroom teachers, as well as school officials, from all sections of the country participate in its work.¹

¹ The National Education Association, 1201 Sixteenth Street, N.W., Washington, D.C., publishes as its official organ the *Journal of the National Education Association*. A two-dollar membership entitles the member to receive the *Journal* and to participate in the work of the association; a five-dollar membership entitles the member, in addition, to receive the *Research Bulletins* and the annual volume, *Addresses and Proceedings*, of the association. The life-membership fee is one hundred dollars, payable in ten yearly installments, and entitles the member for life to the benefits of the annual five-dollar membership.

Both the state and the national associations have subject departments in addition to the general organization. The departments afford teachers the opportunity to work in smaller groups upon specific problems of their respective subjects.

In some fields of study, such as English, mathematics, and social studies, nationwide groups have been formed which are not affiliated with the National Education Association and which hold additional advantages for teachers.

Still another educational organization of significance to every teacher is the World Federation of Education Associations. The organization meeting was held in San Francisco in 1923. Since that date the national education association of almost every nation in the world has become a member. The purposes of the organization are as follows :

THE WORLD FEDERATION OF EDUCATION ASSOCIATIONS

Purposes. The purposes for which such Corporation is to be formed are to promote the cause of education and to elevate the character of teaching throughout the world ; to secure international cooperation in educational enterprises ; to foster the dissemination of information concerning the progress of education in all its forms among nations and peoples ; to advise and promote suitable and effective means to bring into closer coordination the various agencies in every civilized country which have to do with education ; to cultivate international goodwill, and to promote the interests of world wide peace.¹

Individual teachers are not eligible to membership in the federation, but they are represented by their national associations. The Proceedings of the conventions may be purchased from the secretary of the organization² or may be obtained from the library of any higher educational institution. In the course of several generations it is possible that this organization may have great influence in modern civilization, particularly in outlawing war.

Research as a Method of Growth

Many teachers can profit as much from conducting researches themselves as from adapting their procedures to the research findings of others. Both his own research and that of others lead to the development of the

¹ Proceedings of the Second Biennial Conference of the World Federation of Education Associations, held at Toronto, Canada, August 7-13, 1927, p. 781. The Kennebec Journal Press, Augusta, Maine.

² Charles H. Williams, secretary, World Federation of Education Associations, 101 Jesse Hall, University of Missouri, Columbia. Missouri.

teacher. For example, a teacher may study the results of experiments in visual education and from the previous studies add techniques of proved value to his teaching procedures. In addition, however, after he has become established as a teacher he may add to the earlier findings and to his techniques of teaching by his own investigations in the field. The simpler methods of research, those within the ability of almost every teacher, are discussed in Chapter XV. They may be applied to determine the procedures of greatest value to a given teacher, to experiment with new procedures, to discover the needs and interests of pupils, to relate the content studied to the purposes of the school, and to aid in the solution of similar worth-while problems of teaching. Researches both in methods of teaching and in curriculum are constantly necessary to meet the new requirements which society places upon the schools. Each contribution made by the teacher in solving the problems of teaching is a step in his personal and professional development.

Educational Addresses

Even during the first year of teaching, requests come from parent-teacher associations and other community organizations to give speeches on educational topics. Later, almost every teacher has the privilege of participating in programs of local, divisional, or state educational meetings. Quite frequently teachers engaged in research are called upon to report their findings at educational conferences. On other occasions addresses are requested on aims of the schools, methods of the modern school, the new curriculum, relation of school and home, child psychology, and other educational problems.

It is a part of the teacher's work to respond when invited to address a group. A local group will not expect him to speak as an authority on a subject, but he is obliged to present a well-prepared speech. The preparation of such an address entails considerable work. The well-presented address may enlighten the community on school problems. It always causes the teacher to grow.

Professional Writing

Still another means of professional growth consists of writing articles for educational magazines or for local newspapers. Although the beginning teacher rarely has occasion for such activity, he should be ready

if the need arises. Some experience in the classroom or with research work will give him viewpoints, experiences, or findings of value to others. These insights and results of research, when of value, should be given to the profession through its journals.

Travel

The wide perspective and broad understanding which travel gives are more essential to the teacher than to many other professional workers. Marsh states this need of teachers as follows :

While teachers should be saturated with intense love of state and country, they, above all others, should have a broad, sympathetic understanding of the members of all the great families of the world. Travel, if it be but a short distance beyond the immediate community, will lessen intolerance and any unjust pride born of limited knowledge. If we are to think clearly, act generously, and teach sympathetically, we must know the trials, successes, and general conditions of our neighbors on the other side of the river, over the mountain, across the seas, and beyond the near border.¹

Travel will almost invariably bring personal growth and enriched teaching ability. The teacher of history or of literature may gain a fuller appreciation of his field by visiting the sites of historic events or the settings of the literature he brings to his pupils. The social-science teacher can give an enriched offering to his pupils after he has witnessed the actions of various forms of government, has mingled with all classes of society, or has learned the viewpoints of people at all economic levels. The teacher of biology brings a wealth of material to his classes when he returns from a summer at the seacoast, the teacher of art brings new inspiration from the Louvre, and every teacher brings from a summer of travel wider views, new insights, and enriched experience.

It is fortunate that the teacher's long vacation period offers him greater opportunity for travel than is offered any other professional worker. His work can profit most from travel. Although his salary is rarely sufficient to permit travel each summer, careful budgeting and saving will enable almost any teacher to travel fairly extensively every third or fourth summer. Travel in America is inexpensive, especially for groups, and foreign tours at reasonable rates are advertised in all educational journals. Every teacher should make definite plans to gain the personal and professional

¹ From J. Frank Marsh, *The Teacher outside the School*, p. 135. Copyright, 1928, by World Book Company, Yonkers-on-Hudson, New York.

advantages of travel. There is probably no other method of professional development that, for the effort required, yields as much as travel. Travel combines growth with recreation and pleasure.

Postgraduate Study

Although some teachers may not wish to apply the work toward an advanced degree, all can profit much from pursuing courses in college after receiving the bachelor's degree. The teacher will find it extremely difficult to find time during the school year for adequate study of education and of other fields in which he is interested. His time and energy will almost invariably be spent before he finds opportunity to begin the study program. If he is determined to grow, he must consciously fight this tendency, conserve his resources, and definitely pursue his study program.

At least three types of postgraduate study are available to teachers who wish to continue their formal course work. Many higher educational institutions provide correspondence and extension work for teachers, and almost all of them conduct summer sessions to meet the needs of teachers. All three types of study include academic subjects as well as professional courses in education. Many teachers will find their needs much greater in the academic than in the professional work, especially if they attempt to broaden their knowledge of science, social studies, and literature. As a general rule teachers in service have some opportunity to study professional problems in faculty meetings, on committees, and at conventions. With the possible exception of the teacher's own field, few opportunities are offered in the typical school situation for the study of the academic fields of knowledge. Even there he is dealing with immature minds and with the elements of the subject matter, a situation seldom conducive to advanced study. Consequently it is strongly recommended that prospective teachers look forward to additional academic study while teaching.

The type of study is of less importance than the intellectual vitality of the learner. Some students will gain more from correspondence work than others will from regular college work. The contact with scholars which is possible in extension and summer school probably makes such work more valuable than correspondence work, other things being equal.

It should be made clear, however, that the teacher, after graduating from college, may study in many fields without the aid of any institution of learning. The ability to study independently should be a part of the preparation he received in college.

Promotions

Very few beginning teachers are able in less than three years to take advantage of all possibilities for growth offered in the first position. Consequently it is usually advisable to remain in the position at least three years unless an offer of a decidedly better position is received. Even when such an offer is received, the teacher should realize that well-rounded growth in his first position would offset some financial sacrifice.

Given three or five years of work and study in a typical position open to beginning teachers, during which several of the accepted methods of professional improvement have been pursued with vigor and consistency, the teacher is ready for a promotion. It is probable that he has realized as much growth as the position offers. If no promotion is in sight in the system in which he is working, he has the right to seek a better position elsewhere. His future development requires that he move.

Every institution that offers professional curriculums for teachers maintains a bureau to help its graduates to obtain teaching positions. Alumni who have taught several years, as well as graduating seniors, are usually accorded the service. Close contact is kept with the alumnus, and records of his growth and success are placed in the file prepared for him when he registered with the college bureau during his senior year. Superintendents of schools prefer to employ teachers through the college because of the extensive information the college can give about the candidate and because little or no expense is involved either for the candidate or for the school.

Consequently, when the teacher has achieved the greatest possible growth in his first position, he should renew his contact with his college office. The office will then place him on its active files and refer him to positions in which he should be interested, provided vacancies occur in such positions. His confidential papers will be sent to the employing superintendent, interviews will be arranged, and in other ways his college will aid him in obtaining the promotion.

A promotion immediately offers new opportunities for growth to the teacher who has really outgrown his previous position. All the methods of development discussed above will apply with added force to such a teacher. He will become able to assume greater responsibilities and thereby to render larger service with each successive promotion. He should grow as long as he remains in the profession.¹

¹ Alfred Victor Overn, *The Teacher in Modern Education*, Chapter XVIII, "Professional Growth." D. Appleton-Century Company, Inc., 1935.

Values Derived from Professional Growth

The greatest value which accrues to the teacher from professional growth is that value which accompanies a full life. To develop one's powers to the utmost is in itself a challenge which appeals to everyone. Compensation comes not only in the realization that one has done his best but also in the richness that attends the fully developed life and in the satisfaction at seeing others benefited. To the teacher, full development brings the immortality that lives in the memories of those rightly influenced. Into the school, the enriched life of the teacher brings enthusiasm, intellectual vivacity, and inspiration, and through the improved school contributes toward a better society.

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